Université de Montréal

Trends in Uxoricide, Filicide and Parricide: A Time Series Analysis

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Mémoire présenté à la Faculté des études supérieures

en vue de l'obtention du grade de M.Sc. en criminologie

Décembre 2006

Université de Montréal

Faculté des études supérieures

Ce mémoire intitulé :

Trends in Uxoricide, Filicide and Parricide: A Time Series Analysis

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Résumé

Cette étude exploratoire vise à examiner sur une période de 44 ans au Canada des formes spécifiques d'homicides intrafamiliaux. Premièrement, les fluctuations de l'uxoricide (meurtre de la conjointe), du filicide (meurtre de l'enfant) et du parricide (meurtre des parents) sont examinées de 1961 à 2004. Ensuite, des analyses de séries chronologiques sont employées pour vérifier quelles variables macrosociales sont associées aux fluctuations des formes d'homicides mentionnées ci-dessus : divorce, mariage, mères adolescentes, chômage, consommation d'alcool, suicide, avortement et fécondité. Les tendances démontrent que l'uxoricide, le filicide paternel et maternel ainsi que le parricide sont présentement en baisse. Les résultats des analyses de séries chronologiques indiquent que les taux d'uxoricide sont associés au mariage, au chômage, à la consommation d'alcool et à l'avortement; les taux de filicide paternel au divorce et au chômage; les taux de filicide maternel à l'avortement; les taux de parricide à aucune variable. Même si d'autres recherches au niveau macrosocial seront nécessaires sur une période temporelle plus longue et avec plus de variables, il semble que ces types d'homicides familiaux soient associés aux facteurs internes plutôt qu'aux facteurs externes.

Mots Clés : Homicide, uxoricide, filicide, parricide, macrosocial, analyses de séries chronologiques, tendances

Abstract

This exploratory study aims to examine specific types of family homicide over 44 years in Canada. First, the trends in the rates of uxoricide (spousal murder), paternal and maternal filicide (child murder) and parricide (parental murder) are examined from 1961 to 2004. Next, time series analysis is used to determine if any of these types are associated with the following macrosocial variables: divorce, marriage, teen births, unemployment, alcohol consumption, suicide, abortion and fertility. Trends show that uxoricide, paternal and maternal filicide as well as parricide seem to currently be in a decreasing phase. Results of the time series analysis indicate that uxoricide rates are related to marriage, unemployment, alcohol and abortion; paternal filicide rates to divorce and unemployment; maternal filicide rates to abortion; parricide rates to no variables. Although future research would need to be completed at the macrosocial level over more years and with other variables, overall it would seem that these types of family homicide are more influenced by internal rather than external factors.

Key Words: Homicide, uxoricide, filicide, parricide, macrosocial, time series analysis, trends

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For Jay

Acknowledgements

First, I would like to thank my director, Maurice Cusson, for all of his advice, support and guidance. Thanks to your input and assistance, I have managed to submit a very comprehensive and complex dissertation while also greatly enjoying myself. I would also like to thank my co-director, Jacques Marleau, who has supported my research since my internship at Pinel. Your many, many corrections, suggestions and ideas have greatly contributed to this dissertation and to my development as a student and researcher. Also very much appreciated, was the assistance of the statisticians at the Philippe Pinel Institute of Montreal, Nancy Leblanc and Jean-François Allaire, who greatly helped with the statistical analyses.

I want to express my gratitude to all of my friends and family for putting up with me during the last two and half years while I juggled school, work, my family and social life and didn't stop for a second. I need to thank my good friend Martine Milton, without your support I never would have managed to get through my first few years at UdeM and come this far. Your patience and help while I improved my French was invaluable, as was your friendship. I especially need thank Jay, to whom this is dedicated. You never doubted me, especially in the beginning when I needed the encouragement the most. You supported me in your own way, kept me going when I was fed up and you had to live with me throughout this experience. I know that I could not have done this without you and your family. You put everything on hold and patiently waited while I pursued my goals, and I am sure that you will continue to do so for many years to come. You are always ready to encourage me and help me follow my dreams. Hopefully, I can one day return the favour. *Thank You. Love You.*

Introduction

Homicide is an act that never fails to astonish and dismay. When it occurs within the family, it is even more shocking to those involved. Family homicide is prevalent; almost 40% of all solved homicides in Canada from 1994 to 2003 were in the family (Beattie, 2005). Different types of family homicide exist. The situation that occurs most frequently is when a husband kills his wife. According to the data obtained from Statistics Canada for the purpose of this study, there have been close to 2,800 men who have taken the lives of their significant others from 1961 to 2004. The next most common type is when a parent kills a child; mothers and fathers almost equally commit this crime. For the same time period, 541 mothers and 482 fathers killed one or more children. Yet another common type of family homicide that will be examined in this study is the murder of a parent. From 1961 to 2004, 526 men killed a parent according to the data obtained from Statistics Canada. Family homicide is not a rare and isolated act; it occurs more frequently than most imagine.

The first question that comes to mind is why anyone would want to kill a family member, what would be the motive of this type of crime? The literature tells us that depending on the type of family homicide, there are some differences, for instance: vengeance, rage, jealousy, insanity have all been given as motives. Despite these specific reasons for committing family homicides, it has also been shown that there are larger social mechanisms which have an influence on different types of crime, including family homicide. For instance, some say that in times of economic difficulty more crime is likely to be committed (Pottie Bunge, Johnson & Baldé, 2005). These authors found that certain types of crime (homicide, robbery, motor vehicle theft,

break and enter) are influenced by changes in society's structure. Their findings indicated that unemployment, alcohol consumption and inflation were found to be statistically significant variables (Pottie Bunge & al., 2005). Important social or economic changes can have a profound effect on society and on individuals' choices and behaviour. If inflation and unemployment can affect purchasing patterns, for instance, it is also possible that these same factors have an influence on criminal activity.

Few studies have been completed which examine the role of macrosocial variables on family homicide, although this could provide a more complete picture of this type of crime. The few studies which have done so are often based on small samples, making it difficult to generalize the results. Moreover, they are not often examined over time, or if they are it is for too short a period to be conclusive.

In this exploratory study, four specific types of family homicide are examined over 44 years. A special request was made with Statistics Canada in order to obtain all known offenders by specific type of family homicide in our sample. This way, the results from the micro literature are still taken into consideration by examining the types of family homicide separately, and the problem is examined from a broader point of view over a significant length of time. A certain number of macrosocial variables are also introduced in order to see the impact of the changes which occurred in society in the last 44 years. The family unit has evolved since 1961, and so it was important to see if the variations in certain indicators influenced the trends in the different types of family homicide. The variables considered are divorce, marriage, teen births, unemployment, alcohol consumption, suicide, abortion and

fertility. The statistical method chosen to examine this is time series analysis. Although this technique is most often used in economic studies with large samples, it has several benefits in this case. For one, it takes into consideration the element of time. Specifically, it allows for lags in time of the effects of certain variables (i.e. an increase in the divorce rate may only have an impact on spousal homicide a year or more later). Although, this technique is not often used in criminology, in an exploratory study such as this, which aims to investigate several macrosocial variables, it can produce some interesting results.

In order to examine the trends in these specific types of family homicide, the vast amount of literature on homicide and family homicide is first reviewed. Special sections which summarize the pertinent literature relating to the different macrosocial variables are presented. A detailed methodology section explaining the basics of times series analysis is also included. This is followed by a results section which presents the time series models obtained. Next, each type of family homicide is analyzed individually over time by showing the evolution with graphs and using the results of the time series analyses which included the macrosocial variables. In a separate section, the four types of family homicide are compared amongst each other. Finally, in the discussion and conclusion, explanations for the results obtained are presented and future research ideas are suggested.

Literature Review

Homicide is an act that has preoccupied researchers since crime has been studied. Family homicide is particularly interesting because of the close relationship between the victim and the offender. Stories of family homicide have been told for centuries; in Greek mythology for instance, Medea kills her own children in order to get revenge with Jason, and Oedipus kills his father and marries his mother. In recent years, many micro studies have been completed which analyze the motivations and circumstances under which individuals murder a family member (Boisvert & Cusson, 1999; Marleau, Roy, Laporte, Webanck & Poulin, 1995; Marleau, Millaud & Auclair, 2003). Other authors have examined the changes in family homicide over time (Gannon, 2004; Silverman and Kennedy, 1993). Still others examine external factors and causes which can influence this type of homicide (Blumstein & Rosenfield, 1998; Lafree, 1998; Parker, McCall, & Land, 1998). In the following section, the literature concerning family homicide and more specifically spousal homicide, child homicide and parental homicide is reviewed. Existing macrosocial studies on homicide are also considered. Moreover, the specific macrosocial variables which will be considered in this study are examined individually. Finally the research problem is presented.

1. Types of Family Homicide

Family homicide is defined as a homicide which is committed by a husband or wife, a parent, a child, a brother or sister, or another member of the family who is related by blood, alliance or adoption (Dauvergne, 2004). Intimate partner homicide or spousal homicide is the murder between spouses; this includes those who are legally

married, those who are separated or divorced from legal marriage, as well as those in common-law relationships (Gannon, 2004). More specifically, uxoricide is defined as the killing of one's wife, and mariticide[1] as the killing of one's husband (Fritzon & Garbutt, 2001).

Several terms also exist which define child homicide. Filicide, defined as the homicide of one or more children by one or more parents (Resnick, 1969), is the most appropriate since it includes both parents and it includes children of any age. Infanticide is also used by certain authors; it is however a very specific legal term used to describe particular cases of child homicide[2].

Parental homicide or parricide also has several definitions such as matricide, the killing of the mother by the child, patricide, the killing of the father by the child, or double parricide, the killing of both parents (Daniel & Holcomb, 1985; Hillbrand, Alexandre, Young & Spitz, 1999). Other types of family homicide include the murders of the entire family (familicide), brothers (fratricide), sisters (sororicide), grandparents (avitolicide), and other extended family (Dauvergne, 2004, Daniel & Holcomb, 1985, Allen, 1980).

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[1] Other terms that are also used in the literature to define a woman who kills her husband are maricide (Frigon, 2003) and viricide (Allen, 1980).

[2] Infanticide is a specific definition in the Canadian Criminal Code, it occurs "when a female causes the death of her newly-born child (under one year of age), if her mind is considered disturbed from the effects of giving birth or from the effects of lactation", which generally means that the woman is suffering from post-partum depression when she commits the murder (Gannon, 2004).

2. Trends in Family Homicide

Family homicide, as a proportion of all types of homicide has remained relatively stable over time (Cusson, 2000). Data from thirteenth-century England indicate that approximately 6.5% of homicide victims were killed by a relative (Given, 1977). Similarly, in Europe from the thirteenth to the sixteenth-century, family homicides consisted of less than 10% of all types of homicides (Eisner, 2003). This percentage may seem low, but by the seventeenth century, percentages of family homicide began increasing and they reached modern day percentages of 30-40% in England, Germany, Australia and Canada (Eisner, 2003). These higher percentages are attributed to a decrease in private revenge and vendetta type killings, and not to an actual increase in family homicides (Cusson, 2000; Eisner, 2003). More specifically, honour is cited as the most common motivation for homicides from the thirteenth to the seventeenth century, and when these types of male honour killings began to decrease, the proportion of family homicides as a result seemed to increase (Cusson 2000).

From 1993 to 2002, the Canadian data indicates that 37% of all homicides were committed by a family member (Gannon, 2004). During this time, intimate partner homicide represented 47% of all family homicide, filicide and parricide consisted of 25% and 11% respectively (Gannon, 2004). Dauvergne (2004) indicates that the number family homicides in Canada decreased in 2003; it was 24% lower than the number of family homicides in 2002 and it is also well below the average number of family homicides in the last ten years. In Copenhagen (Denmark) from 1959 to 1983 the overall rate of family homicide remained stable (Gottlieb & Gabrielsen, 1990).

However, ten years is not a sufficient time period to be conclusive for the Canadian data, in comparison to the twenty-four years examined in Copenhagen.

In a Quebec study on the evolution of different types of homicide, Grenier (1993) examined family and intimate partner homicides as one group. The author compared children and adults victims of this group of homicides and found that the number of children killed remained stable from 1954 to 1968 as well as from 1976 to 1989, whereas the number of adults victims of family and intimate homicide (includes spousal homicide and parental homicide) was much higher in the second time period (Grenier 1993). However, this study is mainly descriptive and the author does not give any explanation as to what could be influencing these trends.

Few authors have specifically examined the evolution of the rates of intimate partner homicide, child homicide and parental homicide separately. Concerning intimate partner homicide in Canada for both men and women, Silverman and Kennedy (1993) found that the rates per 100,000 married couples have been on the decline from 1961 to 1990. Similarly, Canadian data from 1974 to 2002 reveals that intimate partner homicide rates per million married men and per million married women have decreased by around half (Gannon, 2004). American data also reveals a declining trend for intimate partner homicide from 1974 to 1998 (Shon & Targonski, 2003). On the other hand, in a New South Wales (Australia) study of all solved family homicide, Wallace (1986) found that spousal homicide has increased in the last half century, from 46% in 1933-1957 to 55% in 1958-1967 and to 59% in 1968-1981. The author finds that spousal homicide now constitutes a much larger proportion of family

homicides; however this can be attributed to a decrease in child homicide by women and not to an actual increase in the number of spousal homicides.

The evolution of filicide rates has not been examined by many authors. Gannon (2004) found that the rate of filicide per million children has fluctuated over 1974 to 2002 with no discernible increases or decreases. However, filicides committed by mothers and fathers were grouped together in this study. In Wallace's (1986) Australian study, a decrease was observed for child homicide, from 36% to 24% to 19% over three time periods, 1933-1957, 1958-1967 and 1968-1981 respectively. As mentioned earlier, according to Wallace (1986) it is the character of family killings in New South Wales that changed over the last half century; the proportion of child homicide has decreased while spousal homicide has been on the rise. The author does not discuss what factors could be contributing to these changes.

In the U.S., Shon and Targonski (2003) found that parricide rates per 100,000 persons from 1976 to 1998 were not stable, but declined during this period. According to the authors, this decline is significant in the early 1990's, especially in the case of male parricide offenders. The declining trend displayed by parricides is similar to the decline observed for intimate partner homicide for the same time frame (Shon & Targonski, 2003). According to Shon and Targonski (2003), because parricides did not remain stable over time, as psychodynamic theories would predict, there must be external factors such as shifts in family and marriage structures which are causing the declining trends they found. To the author's knowledge, no Canadian study has been completed which verified the evolution of parricide rates.

Although macrosocial studies on homicide are useful because they are able to offer a global picture and provide a certain number of statistics, microsocial studies are also important in order to understand the dynamics behind this act. In order to be able to fully comprehend the subject, to correctly choose variables to analyze and to make certain methodological decisions, it is useful to examine the existing micro studies. The following three sections summarize the micro literature on intimate partner homicide, filicide and parricide.

3. The Dynamics of Intimate Partner Homicide

The majority of intimate partner homicides are committed by male offenders on female victims. From 1986 to 1996, 84.5% of conjugal homicides in Quebec were committed by men (Cusson, Beaulieu & Cusson, 2003). The fact that women are much more likely to be the victims of intimate partner homicide at the hands of men has not changed for the last several decades. Von Hentig (1948), was one of the first to examine the differences between the victims of homicide and he stated that "when a man is found murdered we should first look for his acquaintances; when a woman is killed, for her relatives, mainly the husband and after that her paramour, present or past" (p.392). Thus, the situations in which men kill their wives are often very different than those in which women kill their husbands. Wolfgang made this distinction in his classical 1957 study on victim precipitated homicide. Wolfgang (1957) found that in the cases where the victim is a direct positive precipitator in the crime, men were especially likely to be the victim of spousal homicide. Therefore, mariticide is more often associated with conjugal violence, in cases of protection from the husband's assault.

Uxoricide usually occurs because of jealousy, the husband refuses to accept that his spouse is ending the relationship, murdering her is an act of possession in order to prevent her from being with anyone else, and it is often followed by the husband's suicide (Boisvert & Cusson, 1999). Daly and Wilson (1988) refer to this jealousy as "male sexual proprietariness" and consider it a dominant issue in regards to marital violence. As a result, women are extremely at risk when their spouses believe that they will end the relationship; accordingly, there are a large proportion of recently estranged women among homicide victims (Daly & Wilson, 1988). Men who kill their spouses often abide by the reasoning: "If I can't have her, no one can" (Daly & Wilson, 1988, p.523). Uxoricide is therefore linked to male jealousy, exclusive possession and infidelity especially in the context of separation or divorce.

Some studies have indicated that uxoricide offenders suffer from psychiatric problems, however, their conclusions vary. Seventeen percent of men who committed spousal homicide between 1997 and 2003 in Canada were suspected by the police of having a mental or developmental disorder (Beattie, 2005). Few studies have specifically examined the psychiatric diagnoses of uxoricide offenders. One author found that men who killed within the family (67%) more often received psychiatric diagnoses than men who killed outside of the family (41%) (Gottlieb & Garielson, 1990). Farooque, Stout, and Ernst (2004) found that of the 28 men in the sample who committed intimate partner homicide, 29% were diagnosed with schizophrenia, 46% with psychotic mental disorder, and 7% with borderline intellectual functioning or mental retardation. However, these results vary according to the type of sample used in the study.

Furthermore, young couples and common-law couples have been found to be much more at risk for spousal homicide (Gannon, 2004). This could be due to the precarious nature of the relationships, as they are more likely to dissolve in the long run compared to those who are married (Cusson & al., 2003). Alcohol has also been found to play a role in the husband losing his inhibitions and acting out (Boisvert & Cusson, 1999).

4. The Dynamics of Child Homicide

4.1 Paternal filicide

Although women are more associated with killing their own children, some authors have found that the opposite is true. In these studies, fathers were found to kill their children in greater numbers than mothers. In Canada from 1993 to 2002, 283 fathers were filicide offenders, compared to 148 which were mothers (victims under 18 years old) (Gannon, 2004). In Scotland from 1978 to 1993, fathers were 1.5 times more likely to kill their children (under one year old) than mothers (Marks & Kumar, 1996).

However, the circumstances under which men and women commit filicide are somewhat different. Men are more likely to kill their children in situations of jealousy and revenge; these men want to make their spouses suffer when there is a possibility that a separation will occur. They often kill or attempt to kill their spouses at the same time as they commit the filicide, before taking or attempting to take their own lives (Marleau, Poulin, Webanck, Roy & Laporte 1999). Fathers are also more often the offenders in cases of "accidental" filicides, also known as fatal battered

child syndrome; these cases are often a result of parental rage, where the parent disciplines the child with violence, which sometimes results in death (Cheung, 1986). In Scotland from 1973 to 1993, 60% of fathers who killed their infants (under 1 year old) did so as a consequence of rage (Marks & Kumar, 1996).

Psychiatric problems do not seem to be as prevalent in the literature concerning paternal filicide. In a clinical study completed by Campion, Cravens and Covan (1988), nine of the twelve men who killed their children had significant neurological or psychiatric disorders. However, in an epidemiological study in Scotland from 1973 to 1993 none of the men attributed the killing of their child to their mental state (Marks & Kumar, 1996). This variable can therefore be difficult to interpret as it varies enormously depending in the type of sample used by the author as demonstrated by the conflicting results of the two studies mentioned above. When authors obtain their samples from psychiatric institutions, there is certainly going to be more cases of men who have psychiatric problems, compared to samples obtained from prisons or police reports.

Fathers are also more likely to kill older children (Daly & Wilson, 1988; Kunz & Bahr, 1996). Furthermore, filicidal fathers are often under the influence of alcohol when they kill their children (Marleau & al. 1999, Campion & al. 1988).

4.2 Maternal Filicide

In general, the micro studies completed on filicide have focused primarily on women. Women more often commit filicide in extended suicide situations or for altruistic

reasons (Marleau, & al., 1995). Altruistic filicides are often associated with suicide and are perceived by the offender as a means to relieve the victim's suffering, whether it is real or imagined (Resnick, 1969). Women who commit filicide rarely have a history of physically abusing their victims compared to men (Husain & Daniel, 1984, Marleau & al., 1995).

Filicidal women more often suffer from a variety of psychiatric troubles such as major depression, personality disorders and psychosis (Cheung, 1986; Resnick, 1969; Husain & Daniel, 1984; Bourget & Bradford, 1990). In Canada over a 23 year period, 67% of women who killed their children were declared mentally ill (Silverman & Kennedy, 1988). In Scotland from 1973 to 1993, 69% of women killed their infants as a result of their mental state (Marks & Kumar, 1996).

Silverman and Kennedy (1988) also found that the women who specifically committed infanticide were mainly single (70%) and young (92.5% under 25 years). Marleau and al. (1995) also found that the filicidal women in there sample were young (average age 26 years), single mothers.

5. The Dynamics of Parental Homicide

Parricide is predominantly committed by men; the ratio of males to females who commit parricide is 6 to 1, and in Canada from 1961 to 1989, 90% of parricide offenders were male (Marleau & al., 2003). American data also indicates that a large majority of parricides are committed by men (Shon & Targonski, 2003). Parricide is also more commonly committed by adults than by adolescents (Hart & Helms, 2003).

Adult and adolescent parricides also differ as to the psychiatric status of the offender and the relationship with the victim (Newhill, 1991). As a result, parricide has often been studied from the point of view of the adult male offender. Several authors also examine different age groups of parricide offenders, separating adolescents and adults in their analyses.

The typical male parricide offender is psychotic, in his thirties, single, unemployed, lives with the victim, and has a difficult relationship with the parent in question (Marleau & al., 2003). The offender is financially dependant on the parent as well as being psychologically dependant or having an enmeshed relationship with the parent (Hillbrand & al., 1999). Similarly, Newhill (1991) found that parricide offenders are often "enmeshed in a hostile-dependant relationship with the parental victim" (p.379). In a review of the literature, Newhill (1991) noted that the parents of the offenders of parricide have similar characteristics; mainly they are considered overbearing, dominating, interfering, belittling, erratic, and explosive.

Results in the U.S. indicate that women who kill their parents almost always kill their fathers and they mainly do so because they were abused (Shon & Targonski, 2003). In a London sample of 17 women who killed their parents, 14 killed their mothers and 3 their fathers (d'Orban & O'Connor, 1989). The authors found that those who killed their mothers were single, socially isolated, in mid-life, lived alone with a domineering mother in a mutually dependent but hostile relationship, whereas those who killed their fathers did so in retaliation against violence.

Hart and Helms (2003) suggest that the single most important factor in parricide cases is child abuse, especially concerning adolescent offenders. Men kill their fathers more often than they kill their mothers; when they do kill their fathers, there is often a history of family violence and the offenders tend to be in their adolescence or late adolescence (Shon & Targonski, 2003). Men are more likely to kill their mothers when they are older than 50 and it is less likely to be under circumstances of abuse, but after extended periods of fighting and arguing (Shon & Targonski, 2003).

There is more of an association with severe mental disorder for individuals who kill a parent than for other types of family homicide, especially when compared to filicide offenders (Farooque & al., 2004). Those who commit parricide are often diagnosed with mental health problems such as paranoid schizophrenia, personality disorders and drug and alcohol abuse (Millaud, Auclair & Meunier, 1996). Farooque and al. (2004) found that schizophrenia (71%) and psychotic mental disorder (76%) dominated their sample of parricide offenders. Similarly, Newhill (1991) found that parricide offenders are especially likely to suffer from psychiatric issues such as schizophrenia. d'Orban and O'Connor (1989) also found that most of their sample of women who killed their parents suffered from psychiatric problems including schizophrenia, psychotic depression, personality disorders and alcoholism. Unfortunately, of the few studies on parricide, most are completed in psychiatric institutions or in psychiatric wards of prisons. Parricide studies conducted in prisons are lacking. Consequently, some of the results from these micro studies may be biased.

6. Macrosocial Research on Homicide

Micro studies can give us a better idea of who these offenders are and the underlying motivations for their actions. However, these types of micro studies do not give any indication as to the scope, the prevalence or the evolution of the problem. Although not much research has been completed at the macro level concerning specific types of family homicide (uxoricide, filicide, parricide), an important amount of research in Canada and on an international level has been conducted on overall homicide rates as well as on family homicide in general. Conclusions from this type of research can sometimes be applied to the more specific study of the different types of family homicide. The literature concerning overall homicide and family homicide in general will be discussed in the following section.

6.1 Macrosocial Studies Using Aggregate Homicide Rates

Since so many studies have been completed on factors associated with aggregate homicide rates, some authors completed reviews of in order to identify the variables that are most often significantly associated with homicide. This strategy also allows for the identification of any discrepancies or contradictory results which can help in choosing the ideal research method and sample type. To the author's knowledge, no Canadian reviews have been completed. In the U.S., Parker and al. (1998) reviewed 44 empirical studies of aggregate homicide rates and summarized the main criminological approaches used across the studies. The first approach and the one they consider the most fundamental is the social disorganization approach. According to Parker and al. (1998) social and economic changes in a community can lead to the deterioration of group solidarity and of social control mechanisms, which

increases conflict and as a result can have an influence on homicide rates. Indicators of this approach include divorce, age structure, and population density. The second theory cited by the authors is strain or deprivation theory which explains that crime is the result of economically deprived individuals who feel blocked from economic opportunities and grow resentful at what appears to them as an unjust system. Indicators of this theory include unemployment, income inequality, and percentage black. Third, Parker and al. (1998) bring up the subculture of violence thesis, which essentially states that a greater predisposition to violence exists among southerners in the U.S. The main indicator of this is the southern region. The authors then summarized the empirical literature based on these three approaches and compared the studies. They found some inconsistent results. Their analysis indicated that the Gini index of income inequality was either positively related to homicide rates or null, and measures of poverty were positive, negative or null. Most of the indicators of social disorganization had varying results, except for the percentage of divorced which was mostly positive across the studies. The authors concluded that these inconsistencies are probably due to research design and methodological issues such as the influence of extreme variables and collinearity. These inconsistencies could also be attributed to the fact that the studies were on aggregate homicide rates, and did not differentiate between the different types of homicide. Flewelling and Williams (1998) concur with the idea that disaggregating homicide rates into more significant and homogenous subcategories is essential so as not to miss any important determinants of one type of homicide.

Several studies have attempted to identify specific macrosocial variables associated with trends in aggregate homicide rates. Using regression analysis on Canadian

homicide rates from 1978 to 1998, Leenaars and Lester (2004) found that the proportion of the population aged 15-24 was positively associated with the total homicide rate. The authors found no significant association with the homicide rate and the birth rate, the divorce rate or the unemployment rate, but they state that homicide is a multidimensional event and that other factors may be involved. Similarly, Sprott and Cesaroni (2002) compared Canadian homicide rates and demographic data from 1974 to 1999 and found that as the proportion of 15 to 30 year olds decreased, so did the aggregate homicide rates. However, the authors concluded that 86% of the decrease remained unexplained and other factors are involved. In the U.S., Blumstein and Rosenfeld (1998) mention that the trends in the aggregate homicide rates are related to economic factors, such as the unemployment rate, changes in the drug markets, gun availability and incarceration rates.

6.2 Macrosocial Studies Using Family Homicide Rates

Several authors have examined homicide using disaggregate homicide rates. Using data for a specific year, 1980, Lester (1998) found that there was a significant negative relationship between U.S. family homicide rates and labour force participation. Parker and Toth (1990) examined disaggregate homicide rates using a number of macrosocial indicators with U.S. data mainly from 1970 (data from 1973, 1974 and 1975 was used for some indicators). The authors raised the issue as to whether sexual intimacy and family membership are distinct, so for their study, they disaggregated homicides into four groups: family intimate (uxoricide, mariticide), family nonintimate (filicide, parricide, and any family member not known to have a

sexually intimate relationship), primary intimate (boyfriend, girlfriend, or ex-spouse) and primary nonintimate (friends, acquaintances, or anyone not related sexually or familially). They examined the following independent variables: proportion low income families, infant mortality rate, proportion Black, ratio of South to non-South, female labour force participation, proportion Spanish surname, income inequality, proportion age 20 to 34, density per square mile, total population, unemployment rate, proportion single-family dwellings, retail activity and marital instability. By analyzing the data on 299 central U.S. cities, the authors found that different macrosocial variables were related to family intimate and family nonintimate homicide rates. Results for family intimate homicides indicated that infant mortality, proportion Black, ratio of South to non-South, and retail activity were all significant predictors. The predictors of family nonintimate homicides were infant mortality, proportion Black, retail activity, population density, total population and the unemployment rate. This is indicative of a different pattern between intimate and nonintimate family homicide. However, some of the variables used by these authors are not necessary applicable or useful for Canadian research.

Using longitudinal data from 1976 to 1994, Chamlin, Cochran and Lowenkamp (2002) examined two macro level theories on the relationship between welfare transfers and homicide rates. Their hypothesis based on social altruism theory is that welfare transfers would depress the levels of homicide among individuals with established affective ties such as family homicide, because welfare reinforces mutual bonds and altruistic values. The other hypothesis they tested is based on the social threat theory that welfare would only be associated with the types of homicide that are perceived as a social threat to the elite in society, such as felony homicide. Using

time series analysis, the results supported the social altruism hypothesis; the model for family homicide had a small, negative and significant association with welfare transfers (Chamlin & al. 2002). The authors conclude that one of the most important findings of the study is the advantage of the longitudinal analysis of disaggregated homicide measures in order to identify relationships that may have been masked by studying total homicide rates.

Other authors have studied homicide rates using a cross-national comparison strategy. By comparing homicide rates and a certain number of predictors across several countries, it is possible to identify the macro level variables which are related to homicide across the countries and more specific variables that could apply to certain types of societies or countries. Gartner (1990) tested cross-national and temporal variations in homicide rates disaggregated by the sex and age of the victim from 1950 to 1980 for 18 nations including the U.S and Canada. Gartner (1990) drew on motivational, control and opportunity theories to identify the macrosocial factors associated with the homicide rates. Motivational concepts were drawn from strain theories, and variables such as social security expenditures as a percentage of GNP and the Gini index of income inequality were tested. Control concepts were based on processes that weakened informal and formal social controls, indicators of this included divorce and cultural heterogeneity. Opportunity concepts were measured by the proportion of the population aged 15 to 29 and a density ratio (ratio of the total number of female labour force participants). Overall results indicated that nations with greater material deprivation, more cultural heterogeneity, more family dissolution, higher female labour force, and greater exposure to violence have higher

homicide rates (Gartner, 1990). The most important risk factor for adults of both sexes was the divorce rate (Gartner, 1990).

7. Macrosocial Research on Different Types of Family Homicide

Differentiating family homicide from total homicide is not always enough because the dynamics within family homicide are too diverse. A New South Wales study on 191 intrafamilial homicides analyzed the behavioural actions at the crime scenes (Fritzon & Garbutt, 2001). The authors inferred the offender's relationship to the victim from the crime scene behaviour and found that there are different dynamics between the different family relationships. For instance the interaction between a parent and a child was very different from the interaction between a husband and a wife (Fritzon & Garbutt, 2001). This confirms the importance of studying uxoricide, filicide and parricide separately. Some authors have examined the problem of family homicide at a more specific level by disaggregating the different types of family homicide. However, the number of studies completed is sometimes small, especially for certain types of family homicide such as parental homicide. The following section summarizes the existing macro level literature on intimate partner, child and parental homicide.

7.1. Intimate Partner Homicide Studies

Concerning intimate partner homicide, Blumstein and Rosenfeld (1998) claim that a decline in domesticity defined as an increase in divorce rates, a decrease in marriage rates and an increasing age of marriage, are responsible for the decline in

intimate partner homicide rates which has been occurring in the U.S. for the last two decades. According to Dugan, Nagin and Rosenfeld (1999), the improvement in women's employment situations and their increasing participation in the workforce have reduced their dependence on men in the last couple of decades. The authors state that an increase in women's economic independence reduces the likelihood of intimate partner homicide. They found that an increase in female status was negatively associated with the rate of married and unmarried male victims; although the relationship was in the direction predicted by their hypothesis, it was short of the .05 significance level. Concerning married and unmarried female victims (uxoricide), the authors did not find a significant relationship with economic independence. Although Dugan and al. (1999) may be correct in the case of women who kill their intimate partners, it is unlikely that greater economic independence will decrease the number of men who kill their wives (uxoricide). Men are more likely to be threatened by a woman's increasing economic independence and status, thus resulting in more conflict in the relationship and increasing the chances of uxoricide.

7.2. Child Homicide Studies

Many authors have studied the macrosocial variables which predict the rates of total child homicide, but not specifically of the rates of homicide committed by a parent (filicide). For instance, Straus (1987) examined trends in infant (less than one year old) and toddler (one to four years old) homicide rates from 1960 to 1980. Using bivariate correlations, the author examined 25 different variables including poverty, urban population, divorce, unemployment, state stress index, female alcoholism, and the rate of aggravated assault. Straus (1987) found that not one of the variables was

associated with infant homicide, but several of them were strongly associated with toddler homicide rates (urban population, divorce, state stress index, rate of aggravated assault, etc.). However, when the author completed regression analysis with the variables for infants, three variables were significant, but the explained variance remained low (Straus, 1987). The author explained the non significant result for infant homicide by stating that it is a unique phenomenon. However, it is possible that certain significant relationships were not revealed in using these statistical methods (bivariate correlation and regression analysis) which do not account for any lag or changes in time and therefore do not acknowledge the social changes which occurred during the sixties and seventies to some of these variables (such as the divorce rate and the unemployment rate).

In a cross national study on the murder of babies (under one year old) of 38 countries, Lester (1991) found positive correlations between the countries with higher murder rates of babies and the suicide rate. However, the author found no association between the murder rate of babies and the overall homicide rate, indices of female inequality or economic activity. In another cross national study of child homicide of seventeen countries, Gartner (1991) found that one of the strongest predictors of child homicide is teen births. The author also found that lower welfare spending, greater participation by women in the labour force and a history of deadly wars were associated with high child homicide rates.

Briggs and Cutright (1994) completed a cross national analysis of all types of child homicide for 21 countries. They included variables representing family stress

(divorce rate, percentage of females in labour force, social insurance expenditures[3], etc.), female status (female to male tertiary enrolment[4]), social integration (income inequality, population heterogeneity) and culture of violence (rape rate, battle deaths). The authors examined three age groups, infants, one to four year olds and five to fourteen year olds using multivariate regression analysis. The authors found that the divorce rate, the percentage of females in the labour force, the female to male enrolment in tertiary-level education and the rate of rape were all significantly associated with child homicide rates for the three age groups. The authors also found that the fertility rate was negatively and significantly associated with child homicide, but only for the five to fourteen year old age group. Despite the significance of these variables, the authors concluded that other important unmeasured variables may not be included in their model because of the low explained variance of the model.

Although many cases of child homicide probably include filicides, none of the above authors differentiated between those who killed their own children. The studies mentioned did not specifically calculate filicide rates, or differentiate between mothers and fathers who commit filicide. This is a major limit of these studies, as the dynamic between those who kill their own children and those who kill a child they are not related to is not the same.

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[3] The social insurance expenditure variable is a percent of each country's gross domestic product.

[4] The female to male tertiary enrolment variable is a 10 year lagged ratio of women per 100 males enrolled in tertiary level education.

7.3. Parental Homicide Studies

As previously mentioned, almost all of the literature on parricide has been completed at the microsocial level. To the author's knowledge the only study which examined the rates of parricide over time is Shon and Targonski's study (2003). The authors used graphical analysis to examine the trends in U.S. parricide rates from 1976 to 1998. The authors conclude that there is an overall descending trend in parricides for this time frame, similar to the trend seen for intimate partner homicide. The authors conclude that as is the case with other types of homicide, social structures affect parricides as well. However, the authors do not empirically investigate these structures; they simply say that they can see how changes in family and marriage could affect parricides.

8. Macrosocial Variables

Certain authors have attempted to study homicide using variables which are not traditionally tested. There are also some more common variables which simply have not been exhaustively tested. These variables have not necessarily been verified for their association with family homicide, but often with crime in general, with violent crime or with overall homicide rates. There are several variables which are of interest to the specific types of family homicide being examined in this study. In this section, the variables that were chosen for analysis are examined one by one. Although, each variable has been previously mentioned as part of different studies, the interest and importance of each macrosocial variable is detailed separately in this section.

8.1. Divorce & Marriage

Divorce rates, marriage rates and ratios of divorces compared to marriages have been associated with overall homicide rates in several studies. However, depending on the methodology of the author there have been varying results. In a cross-national study, Gartner (1990) found that the number of divorces per 1,000 marriages was one of the most important predictors of female and male homicide rates from 1950 to 1980. Dugin and al. (1999) analyzed intimate partner homicide using a panel of 29 large U.S. cities for 1976 to 1992. Concerning the divorce rate, the authors found that in cities where the divorce rate is increasing, unmarried women are more likely to be killed by their intimate partners. In the same study the authors also found a significant relationship between the decrease in the rate at which women marry and an increase in the rate at which women are killed by their intimate partners. Daly and Wilson (1992) compared couples who were co-residing with estranged couples in registered marriages. The authors found that men are more at risk to be killed by their wives if they are still living together, whereas women are much more at risk to be killed if they are separated from their spouse.

Several authors have stated that the threat of rejection by the spouse, (i.e. separation or divorce) can trigger violent behavior in the male partner. These types of spousal homicides, also referred to as possessive homicides comprised of 54.4% of all spousal homicides in a Montreal study (Boisvert & Cusson, 1999). These men are unable to accept the woman's decision to end the relationship. Men who kill their wives often explain that they committed the murder "as a response to the intolerable stimulus of the wife's departure" (Browne, Williams & Dutton, 1999, p. 160).

Divorce should therefore be positively associated with uxoricide rates as the literature on the dynamics of this type of homicide suggests. Inversely, marriage could be negatively associated with uxoricide, seeing as common law couples are more at risk than married ones. Using similar reasoning, paternal filicide should be positively associated with divorce, considering that many filicidal men kill their children to make their spouses suffer.

8.2. Teen Births

The teen birth rate or ratio is a variable that is more often tested in studies on child homicide than specifically on filicide. Gartner (1991) predicted that rates of child homicide should be higher when there are more single, young mothers from non intact families. Gartner (1991) tested infant and child homicide rates across 17 nations and analyzed several independent variables including the percentage of teen births, illegitimate birth rate, the divorce rate, etc. The author found that the only significant predictor of infant homicide was the percentage of teen births. Concerning child homicide rates, teen births remained a significant predictor but to a lesser degree than for infants (Gartner, 1991).

Adolescent mothers are often not prepared or equipped to raise a child. The children they have are often unplanned or unwanted. Young parents aged 15-24 years are responsible for 59% of filicides aged less than a year old (Dauvergne, 2005). Lack of parenting skills are one of the factors which can contribute to younger parents' inability to cope with the pressures of parenting (Dauvergne, 2005). Maternal filicide rates should therefore increase as the number of teen births increase. The

relationships between these adolescent mothers and the fathers of the children are likely to be uncertain. The father might feel resentment towards the child and resort to filicide, although probably not as often as the mother would, since it is easier for the father to leave and detach himself from the situation. As a result, the rate of maternal filicide should be the type of family homicide which is most strongly and positively associated with the number of teen births.

8.3. Unemployment & Income Inequality

In many studies, an association between unemployment and income inequality[5] has been found with the overall homicide rate. When society is experiencing an economic depression or simply, more difficult times, frustrations increase and it is likely that the family homicide rate will increase as well. Pottie Bunge and al. (2005) used time series analysis to verify the relationship between Canadian homicide rates and unemployment rates from 1962 until 2003 and they found that the two variables were positively associated. Using bivariate correlations and partial correlations, Daly, Wilson and Vasdev (2001) found that income inequality is a strong and significant predictor of total homicide rates for the ten provinces in Canada. This strong positive relationship between income inequality and homicide for the provinces remains when the authors take into consideration time, and analyze the data over 16 years in four year blocks. However, when Daly and al. (2001) consider the national homicide rate and income inequality for the country over the 16 year period, the relationship loses

[5] The GINI index is one of the more popular measures of income inequality. A number between zero and one, it measures the relative degree of inequality in income distribution. According to Statistics Canada (Table 202-0705), in a population where every member has the same income (minimal inequality), the GINI score would be zero, whereas the score would be one in a population where one member received all of the income and the others received none (maximum inequality).

its significance. In Lafree's (1998) review of cross-national comparative studies of homicide, the positive association between economic inequality and homicide rates is one of the most consistent findings in the literature. In Parker and Toth's (1990) U.S. study, the category of family non-intimate homicide which includes filicide and parricide, had a positive and significant relationship with the unemployment rate. However, the authors found no relationship with the GINI index of income inequality.

An important situational factor which is found to push certain men to take drastic measures, such as uxoricide or paternal filicide, is the loss of a source of income. In a comparison of all domestic (family) and non-domestic (stranger, acquaintance) homicide committed by men in the Midwestern US, the domestic group was much more likely to have experienced a recent loss of a job than the non-domestic group (Daniel & Holcomb, 1985). Men who commit parricide are often unemployed and living at home with the parent they kill (Marleau & al. 2003). In times of low unemployment, it is possible that more of these potential individuals will find jobs and move out, resulting in less of an opportunity to commit parricide. Therefore it is likely that the uxoricide rate, the paternal filicide rate and the parricide rate will be positively associated with the unemployment rate and perhaps to a lesser degree to the income inequality index.

8.4. Alcohol Consumption

Few studies have attempted to examine the link between alcohol and family homicide at the macro level. In a cross-national study, Bridges (2005) found that overall homicide rates and membership in Alcoholics Anonymous were associated,

but no relationship was found between homicide rates and alcohol consumption. A study in Belarus indicated that there is a positive and statistically significant association with strong spirits per capita consumption and the violent mortality rate (Razvodovsky, 2003). Using time series analysis from 1962 to 2003 a Canadian study found a significant and positive relationship between overall homicide rates and alcohol consumption (Pottie Bunge & al., 2005). The effects of alcohol consumption on different types of family homicide in Canada have yet to be examined.

On the other hand, alcohol consumption is a variable that has often been identified in clinical studies as a contributing factor. Between 1994 and 2003, 60% of both men and women who killed a spouse were under the influence of either drugs or alcohol at the time of the homicide (Beattie, 2005). Moreover, close to two thirds of all uxoricide offenders in Quebec were found to be intoxicated at the time they committed the offence, especially by alcohol (Boisvert & Cusson, 1999). In a clinical sample on intimate partner homicide which included both men and women, substance abuse was involved in over a third of the cases (Farooque & al., 2004). Alcohol consumption can contribute to a homicidal situation by lowering an individual's social inhibitions, making them less reasonable than under normal circumstances (Cusson & al., 2003).

Alcohol abuse is also prevalent in paternal filicide. A study completed at the Philippe Pinel Institute of Montreal from 1982 to 1994 indicated that 7 of the 10 men who killed one or more children had a history of drug and/or alcohol abuse (Marleau & al.,1999). Similarly, Campion and al. (1988) found that substance abuse was a

critical factor in most paternal filicides; 7 of the 12 men in their sample were intoxicated when they perpetrated the filicide. Alcohol consumption and alcohol abuse is much less prevalent among maternal filicide (Marleau, & al., 1995).

Substance abuse is also characteristic of parricide offenders. In a study of 39 parricides and attempted parricides, more than half had a history of alcohol consumption or drug use within the six months prior to the offence, and 18% were intoxicated at the time of the offence (Marleau & al., 2003). Although many parricides fantasize about murdering their parents in advance, in some cases an episode of heavy drinking is needed for the offender to actualize the fantasy (Newhill, 1991). Considering the micro studies and those on overall homicide rates, alcohol consumption should be positively associated with uxoricide, paternal filicide and parricide.

8.5. Suicide

Amongst the number of homicides committed each year, those which end in the suicide of the offender are considered rare. In 2003 there were a total of 548 homicides committed in Canada; of this number there were 29 cases of murder-suicide (Dauvergne, 2004). Suicide is definitely more prevalent among family homicides, 77% of the murder-suicides committed in 2003 involved family members (Dauvergne, 2004). Similarly, a study completed in Copenhagen found that intrafamily offenders were more likely to have suicidal tendencies than extrafamily offenders (Gottlieb & Gabrielsen, 1990).

Men are primarily the ones who commit this type of homicide. From 1993 to 2002 31% of men who killed their wives committed suicide afterwards and at least an additional 2% of men who killed their wives attempted to kill themselves afterwards (Gannon, 2004). In Canada, of all the men who committed murder-suicide in 1999, most killed themselves after killing their wives (48%), one or more of their children (15%), or both their wives and children (13%) (Langlois & Morrison, 2002). In 1999 all cases of murder-suicide in Canada which involved multiple victims were committed by male offenders (Langlois & Morrison, 2002). However, suicide itself is more prevalent among men; in Quebec from 1999 to 2001, men exceeded women in death via suicide by 300% (St-Laurent & Bouchard, 2004).

Offenders of filicide often commit suicide as well. From 1993 to 2002, 28% of parents who killed a child committed suicide afterwards (Gannon, 2004). Men and women who commit filicide are almost equally likely to commit suicide afterwards; from 1993 to 2002, 29% of fathers and 28% of mothers killed themselves after killing their children (Gannon, 2004). Similarly, close to one third of the filicide offenders in New South Wales either committed suicide or attempted to do so (Wallace, 1986). Millaud and al. 1996 found that a number of parricide offenders have suicidal thoughts before (8.3%) or after killing their parents (8.3%), and only some of them attempt to kill themselves (16.7%). Considering the importance of suicide in family homicide, it is probable that the national suicide rate will be positively associated with uxoricide as well as maternal and paternal filicide.

8.6. Abortion

The idea that abortion could contribute to lowering crime is controversial. Several authors have examined this idea. Recently, Donohue and Levitt (2001) raised the idea that legalized abortion is largely responsible for the crime drop in the nineties that the U.S. experienced. The authors created an index which included the number of legalized abortions and using a 20 year lag, they found a causal relationship between abortion and crime. As abortions increased in the seventies, crime fell accordingly for the years where these children would have been criminally active (Donohue & Levitt, 2001). Donohue and Levitt (2001) calculated that an increase of 100 abortions per 100 live births is responsible for reducing several types of crime (murder, property crime and violent crime) by 10%. The authors contend that children who were not planned have less of a chance of succeeding in life because these types of pregnancies are often "associated with poorer prenatal care, greater smoking and drinking during pregnancy, and lower birth weights" (Donohue & Levitt, 2001, p.414). These characteristics are associated with increased chances of committing crime later on in life.

Similarly, this reasoning could be applied to the different types of family homicide. An increased number of children who were raised in the above mentioned circumstances could contribute to those who resort to crime, violence or aggression in their personal lives. It is possible that more of these individuals would commit family homicide. As a result, when abortions increase, family homicide in later years should decrease. However, in Canada for family homicide, this would be impossible to calculate, as the data set is not long enough to allow for a sufficient time delay

since the legalization of abortion in 1969. Men who commit family homicide are generally older. For instance, the average age of uxoricide offenders in Quebec from 1986 to 1996 is 42 years (Cusson & al. 2003). More time would need to elapse before it would be possible to examine this possibility.

However, the number of legalized abortions performed could have a more immediate effect on maternal filicide. Using self-reported pregnancy histories, Donohue and Levitt (2001) estimated that 75% of unwanted births are aborted. After the legalisation of abortion, young mothers who found themselves in a difficult situation had a choice. An important motive for mothers who commit filicide is "unwanted child" (Resnick, 1969; Cheung, 1986). Abortion was legalized in Canada in 1969. According to Statistics Canada, in the first year that abortions were readily available, 11,200 were legally performed in Canada. In 1975 close to 50,000 were performed, and in 1980 the number rose to over 70,000 abortions. Abortion became accessible, affordable, and more socially acceptable. Therefore, it is possible that a certain number of women who may have been overwhelmed with the prospect of having a child and who where not equipped to deal with a child would have committed filicide. Instead, after abortion was legalized, these women opted for an abortion and were never put in the situation that may have led to a filicide in the first place.

Some authors did not specifically examine the relationship between filicide and abortion but examined child homicide and abortion instead. In a cross-national study on child murder of 17 nations, Lester (1995) tested the strictness of abortion laws and the abortion rate with the murder rate of children. Initially, a positive association was found between strictness of abortion and the murder of children aged zero to

one year, but this disappeared when the author introduced controls for the gross domestic product. In the U.S. Sorenson, Wiebe and Berk (2002) tested the relationship between abortion and child homicide. Using an interrupted time series analysis, the authors found that the legalization of abortion in the US in 1973 resulted in a decrease of toddler homicide (one to four years old), but the same relationship was not found for infants (less than one year old). Sorenson, Wiebe and Berk (2002) suggest that the data for infants is more variable and therefore difficult to analyze, which could explain the lack of a statistically significant association. Perhaps, by using more specific categories such as maternal and paternal filicide, the association would be more apparent. The number of abortions should therefore be most strongly associated with the number of maternal filicides. As the number of abortions increase, the number of maternal filicides should decrease.

8.7. Fertility

Concerning family homicide, the fertility rate can be used as an indicator of the number of people per household. This allows the testing of family homicide using a routine activity approach. Cohen and Felson (1979) state that criminal acts occur as a result of the convergence in space and time of likely offenders, suitable targets and the absence of capable guardians. The fertility rate is used as variable representing this approach which is relevant to family homicide. As the members of a family increase, the number of possible guardians in a household increases as well. The more people who are present in the home during an argument that can potentially intervene, the less family homicides will be committed. Cohen and Felson (1979) argue that a shift in routine activities whether at the home, at jobs away from the

home, or other activities away from home, can change the probability that motivated offenders converge in space and time with suitable targets and in the absence of capable guardians. Therefore, should the number of members living in each household increase, the probability of this convergence for family homicide decreases.

A homicide is a conflict which escalates to a lethal blow. Many arguments have the potential to turn into a homicide, but so many of them do not, often because of the presence of a peacemaker who can reduce conflict. Felson (2002) gives the example of a peacemaker's role in a typical fight among intoxicated men. If no one in the audience comes between the two actors to attempt to act as a peacemaker, it is likely that the conflict will escalate. If those surrounding the two actors encourage instead of discourage the fight, it is more likely to end badly. The origin of a fight which ends in assault is not that different from the one that ends in a homicide (Cusson & Proulx, 1999). The third party can exert a significant influence on the development of an argument without actually being a protagonist by: encouraging the fight to continue, separating the two, calming the situation down (Cusson & Proulx, 1999). Therefore, it is highly likely that the greater number of people that reside in a household, the more likely one of those individuals is to play the peacemaking role and prevent arguments from resulting in homicide, thus reducing the overall number of family homicides. This is especially the case with parricides. A sibling who intends to kill a parent can be deterred by the presence of additional siblings. As the fertility rate increases, a decrease in family homicide, and especially parricide, should be observed.

9. Research Problem

Several authors consider that intimate partner homicide, child homicide and parental homicide have different dynamics (Parker & Toth, 1990; Shon & Targonski, 2002; Farooque, & al., 2004, etc.) which can be further differentiated by the sex of the offender (Marleau & al. 1995; Marks & Kumar, 1996; Marleau & al. 2003; etc). Despite these differences, many authors choose to group all types of family homicide together. In order to determine any fluctuations in time or any variables which could be associated with the different types of family homicide, it is important that they be examined separately. Otherwise, statistical differences may not be revealed, as any effects could cancel each other out, or not be strong enough to be measured. By examining the different types of family homicide separately, any differences in the evolution of the uxoricide, paternal filicide, maternal filicide and male offender parricide in the last 44 years can be identified.

Considering that the dynamics of all four types of family homicide are different at an individual level, will the macrosocial variables studied have different effects on the rates of the four types of homicide over time? As previously mentioned, most macrosocial studies have not disaggregated the different types of homicide. The studies which have done so usually focus on one type of family homicide and have not compared the different types. Moreover, many studies use American data, and the variables chosen often do not represent Canadian reality. Therefore, it is important to complete a comparative analysis of the most common types of family homicide in Canada using a range of macro level variables. The following specific macrosocial variables will be examined for any association with the four types of

family homicide: divorce, marriage, teen births, unemployment, alcohol consumption, suicide, abortion, and fertility. First, the results of each of the four types of family homicide will be examined individually over time, and then they will be compared amongst each other.

Methodology

One of the goals of this study was to examine specific types of family homicide from a macrosocial perspective. Since family homicide, especially once disaggregated is a relatively small phenomenon, it was very important that the choice of the sample is precise and accurate. Moreover, because time was included as a factor, it also became important to have a long series of data to be able to perform the statistical analyses. The need for precise data as well as the requirement of a large enough sample put certain restrictions on the data collection of the variables. The following section describes exactly how each variable used in the statistical analysis was collected. In the second section, the theory behind the statistical method, time series analysis, is explained.

1. Data Source

1.1 Family Homicide Variables

In order to have the most accurate data concerning uxoricide, paternal filicide, maternal filicide and parricide, a special request was made with Statistics Canada. This was important for two reasons. First, some offenders kill multiple victims in one incident. For instance, a man might kill his wife and child at the same time. This is both a case of uxoricide and of filicide. By only including uxoricide offenders who killed one victim, their spouse, there is no chance of double counting any incidents. Moreover, there is no debate as to which group these offenders belong to. As a result, in the request that was made incidents involving multiple victims were excluded for uxoricide, incidents involving multiple victims who were not the

biological or adoptive children of the accused were excluded for filicide and incidents involving multiple victims who were not the biological or adoptive parents of the accused were excluded for parricide. Therefore, the data used was not contaminated and only contained the specific cases of uxoricide, paternal filicide, maternal filicide and parricide. The second reason that the request was made for the offenders who killed a family member is related to the macrosocial nature of the study. One of the purposes of the study is to examine whether there are any sociological changes in society (such as divorce, unemployment, abortion, etc) have an impact on the different types of family homicide. These factors are more likely to have an influence on the offender, and not the victim. The longest data series possible was requested; unfortunately, no accurate crime statistics are available before 1961 in Canada, especially concerning offenders of family homicide. The data for the different types of family homicide in Canada from 1961 to 2004 was obtained from the Statistics Canada Canadian Centre for Justice Statistics, Homicide Survey as described below.

Uxoricide. The request was made for the number of male offenders per year, who killed only their spouse, where spouse is defined as those who are legally married, common-law, divorced, separated, as well as intimate partners. Same-sex spouses are excluded. The number of men who killed a spouse was obtained. Cases involving multiple victims (i.e. children, other family members killed at the same time) were excluded. Cases involving multiple accused (i.e. where the husband and another person kill the spouse) were excluded as well.

Paternal Filicide. The number of male offenders per year who killed one or more children in one event was requested. Cases involving multiple victims (i.e. where other people such as a spouse are killed) were excluded. Only biological and adoptive children were included. Step children were excluded. Cases involving multiple offenders were also excluded.

Maternal Filicide. The number of female offenders per year who killed one or more children in one event was obtained from Statistics Canada. Cases involving multiple victims (i.e. where other people such as a spouse are killed) were excluded. Only biological and adoptive children were included. Step children were excluded. Cases involving multiple offenders were also excluded.

Parricide. The number of male offenders per year who killed their mother and/or father was obtained from Statistics Canada. Double parricide, where both the mother and father are killed at the same time by the offender is equivalent to one event[6]. Cases involving multiple victims which are not the parents of the offender are excluded (i.e. brother, sister). Only cases involving biological and adoptive parents are included; step-parents and foster parents are excluded. Cases involving multiple offenders are also excluded.

Although accurate criminal statistics are available as of 1961 from Statistics Canada, some improvements were made to the data collection as of 1974. One of these

[6] These events are quite rare, there are not many of them per year. Parricide offenders generally kill one of their parents (Marleau and al., 2003; Millaud and al., 1996)

improvements affected homicide statistics, more specifically manslaughter[7] and infanticide cases. Prior to 1974 homicide only included first and second degree murder. Not only was data on manslaughter not included in the statistics, it was not collected at all during this time period. Similarly, data on infanticide was not collected either. Therefore the number of family homicides from 1961 to 1973 may be undercounted, especially for maternal filicide because infanticides would fall under this category. In order to counter this problem a request was made with Statistics Canada for a detailed breakdown of the violations (first degree murder, second degree murder, manslaughter, infanticide) for each type of family homicide from 1974 to 1979. Using this information, it was possible to approximate how many cases of manslaughter and infanticide there are on average per year for each type of family homicide. An average of the number of manslaughters and infanticides for each year was taken for each type and was added on to the affected data (1961 to 1973). This technique was also applied to the six years that the real numbers were available (1974 to 1979) and the results are quite accurate[8].

1.2 Macrosocial Variables

The following macrosocial variables were obtained from various sources, but mainly from different Statistics Canada surveys. CANSIM, Statistics Canada's socio-economic database was frequently consulted; the table numbers and titles are listed when it was used for a variable. The data source for each variable is described below.

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[7] The Criminal Code section 234 defines manslaughter as "Culpable homicide that is not murder or infanticide". Manslaughter is essentially a homicide without the intent to kill that does not fall under the specific definition of an infanticide (see footnote 2 for a definition of infanticide).

[8] Details concerning these calculations can be found in Appendix in Table V.

Population. The total population was obtained from CANSIM Table 051-0001 *Estimates of population, by age group and sex, Canada, provinces and territories, annual (Persons)* for the years 1971 to 2004. The total population for 1961 to 1973 was obtained from the publication Juristat (1985). The population data was only used as a denominator, to calculate the rates of the four types of family homicide per 100 000 of the population, and it was also used to calculate the rates for the various macrosocial variables as described below.

Divorce Rate. The number of divorces per year was obtained from CANSIM Table 053-0002 *Vital Statistics, divorces, annual (Number)* from 1970 to 2004. The data for 1961 until 1969 was obtained from the Statistics Canada publication, *Historical Statistics of Canada.* The absolute number of divorces per year was divided by the population for each year and multiplied by 100 000 in order to calculate the divorce rate per 100 000 of the population. All of the rates per 100 000 of the population in this study were calculated in the same way (uxoricide rate, paternal filicide rate, maternal filicide rate, parricide rate, marriage rate, suicide rate)

Marriage Rate. The number of marriages in Canada per year from 1961-2004 was obtained from CANSIM Table 053-0001 *Vital statistics, births, deaths and marriages, quarterly (Number)*. The marriage rate per 100 000 of the population was calculated using the total population.

Teen Births. The number of live births to mothers aged 19 years old and under for 1974 to 2004 was obtained from CANSIM table 106-9002 *Pregnancy Outcomes, by age group, Canada, provinces and territories, annual.* However, in order to include

the earlier years of 1961 to 1973 the Statistics Canada publication *Selected Birth and Fertility Statistics, Canada, 1921-1990* was also consulted to complete the sequence.

Unemployment. The unemployment rate is the percentage of the labour force which is unemployed. The rates for 1976 to 2004 were obtained from CANSIM Table 282-0002 *Labour force survey estimates, by sex and detailed age group, annual.* The Statistics Canada publication, *Historical Statistics of Canada* was consulted in order to obtain the rates for 1961 until 1975.

Alcohol Consumption. The consumption of alcoholic beverages by the population over 15 years of age in litres per year was obtained from CANSIM Table 002-0019 *Per Capita disappearance of major food groups in Canada, computed annual average,* for the years 1961 until 2004.

Suicide. The number of suicides in Canada from 1961 to 1992 was found in the 1994 Health Canada publication *Le suicide au Canada*. The data from 1993 to 1998 was retrieved from the Statistics Canada publication *Suicides et tentatives de suicides*. In order to ensure accuracy, years that overlapped in the two publications were compared to ensure similar data collection methods by the two publications (i.e. according to both sources 3,709 was the number of suicides in 1992). The more recent data was obtained from CANSIM table 102-0051, *Deaths, by selected grouped causes, age group and sex, Canada, provinces and territories, annual.* This data was converted into a rate per 100,000 of the population.

Abortion Ratio. The ratio of induced abortions per 100 live births were obtained from Statistics Canada's CANSIM Table number 106-9013 *Induced abortions, by area of residence of patient, Canada, provinces and territories, annual.* The data was available from 1970 to 2004 and includes only Canadian residents. The number of abortions prior to 1970 is not available as Canada only implemented its abortion law in 1969. Only legal abortions are included.

Fertility. The fertility rate per 1,000 women age 15 to 49 years for Canada was obtained from the *Annual Report 2000 of the Division of Vital Statistics of the British-Columbia Government* for 1961 until 1997. The rates for 1998 until 2004 were obtained from CANSIM Table 102-4505 *Live births, crude birth rate, age specific and total fertility rates, Canada, provinces and territories, annual.*

Each of these variables will be used in the statistical analysis in order to determine possible relationships with the different types of family homicide. The following section explains the type of statistical analysis used to examine the trends in uxoricide, paternal and maternal filicide, and parricide.

2. Statistical Method

Time series analysis is completed in order to determine which macrosocial variables are associated with the fluctuations in the different types of family homicide rates over time. The most commonly used method of time series analysis is the Box-Jenkins method, this method is popular because of its generality, the fact that it can handle any series whether it is stationary or seasonal (Maddala & Kim, 1999). Other

methods exist such as interrupted time series, seasonal decomposition, exponential smoothing, Fourier analysis, but these are often used for very specific types of data (StatSoft, 2006).

There are five basic steps to the Box-Jenkins methodology[9]. The first step is differencing the times series in order to achieve stationarity (Maddala & Kim, 1999). The distribution of the dependant variable must therefore be verified and any transformations made in order to obtain as stable a time series as possible. A time series is stable when its parameters are within a certain range (StatSoft, 2006). This is a requirement of time series analysis, otherwise, the analysis cannot be completed.

The second step of the Box-Jenkins methodology is the identification of a tentative model (Maddala & Kim, 1999). This is accomplished by examining the auto-correlations and partial auto-correlations to determine whether it is an auto-regressive model (AR), a moving average model (MA), or a combined model (ARMA). If the mean of the time series is not stationary, a differencing procedure is required which results in an integrated model (ARIMA). There are no clear cut rules to determine this; it is more of a judgement call in order to arrive at a tentative model (Maddala & Kim, 1999). It is possible to go back and re-examine the auto-correlations, it is not always a straightforward decision, and in some cases not only does it require experience, but experimentation with alternative models (StatSoft, 2006). Due to these reasons, statisticians were consulted for this research project in

[9] See Figure 7 in Appendix for a diagram of the Box-Jenkins methodology.

order to be certain that the models were correctly identified and that all the requirements were followed.

Once identified, the parameters of a time series model can either contain a *p*, *d*, or *q*. The *p* represents the auto-regressive element or the lingering effects of previous years' rates (Tabachnick & Fidell, 2000). The *d* represents the integrated element for trends in the data and the *q* represents the moving average element for the effects of previous random shocks (Tabachnick & Fidell, 2000). The resulting models can be varied, a purely auto-regressive model would be (1, 0, 0), the model can also have more than one parameter of each, for instance the model (2, 1, 2) has two *p* and two *q* parameters (StatSoft, 2006). It is possible, but rare that the parameters are greater than two (StatSoft, 2006).

The third step is the estimation of the model which was identified in the second step (Maddala & Kim, 1999). The parameters of the model are estimated and tested with any dependant variables in order to ensure their significance. If they are statistically significant, the *t-values* of the different variables in the model can be used to examine the impact of the variables (StatSoft, 2006). The Ljung-Box *Q* statistic is used to examine whether or not the model is correctly specified, its significance must be greater than .05 in order to be certain that the model is correctly specified (SPSS Trends, 2005). Goodness of fit of the model can be examined using the stationary *R*-squared value, which provides "an estimate of the proportion of the total variation in the series that is explained by the model" (SPSS Trends, 2005, p.91). Both of these statistics are consulted in this research project.

The fourth step, referred to as diagnostic checking, is to ensure that the model adequately describes the data (Maddala & Kim, 1999). This involves making sure that the residuals are uncorrelated by graphing their auto-correlations. Should the residuals be correlated, one would have to return to the second and third steps to modify the model in order to continue the analysis. The analysis of the residuals is considered an important test of because if they are correlated, then the specified model is inadequate (StatSoft, 2006). They should be randomly distributed. The residuals for the models identified in this study are examined.

The fifth possible step is referred to as forecasting, which is most commonly used by economists in order to predict changes in markets (Maddala & Kim, 1999). With forecasting, the value of the dependant variable can be predicted in upcoming years based on past trends identified by the time series model.

Bivariate time series analysis involves the same procedure as above in order to identify the model, but, independent variables are added into the analysis. In our case, the variables are added separately. Individual time series analyses were completed for each macrosocial variables, because the different variables may have opposite effects and cancel each other out. Also, seeing as the analyses are for a relatively short period for time series analysis standards, having several independent variables in an analysis under these conditions are unlikely to yield significant results. Generally speaking, the minimum number of observations needed to complete time series analysis is 50, (Tabachnick & Fidell, 2000). With 44 observations, we are close enough to 50 to proceed with the analysis and obtain valid results. Other authors have proceeded to complete time series analysis on

smaller samples (Pottie Bunge & al. (2005) used 42 observations, Ramstedt (2001) used 29 observations, Gmel, Rehm & Ghazinouri (1998) used 41 observations), as it is sometimes difficult to obtain a large sample in the social sciences.

It is not always possible to find a time series model for all dependant variables. Some are simply considered white noise or random, meaning there is no perceptible trend in the data and in this case, time series analysis cannot be completed. The previous years' data must be associated with the present years' data in order to use time series analysis. Time series analysis allows you to remove this autocorrelation effect. If the data is auto-correlated, as time series data frequently is, then regression should not be used as one of the requirements of regression analysis is that the residuals are not correlated (Howell, 1998). Often with time series data, the previous years are associated with the present or future years, as is the case with homicide rates, which is why time series analysis was the ideal technique to use in this case.

Other types of analysis which require fewer observations were not be as appropriate as they do not take into consideration the time factor as time series analysis does. In the last 44 years much has changed in society, in this study, macrosocial variables such as unemployment, divorce, marriage, abortion, have significantly evolved since the early sixties. This is why we found it so important to complete the analysis with time series, as it would be the best measure to identify if any trends in these variables are associated with trends in the different types of family homicide. The nature of the family unit has changed drastically since the beginning of our data set, there have been a number of social evolutions which have a direct impact on the

family and as a result on family homicide, making it important to consider the family homicide variables over time.

Using the Expert Modeler Tool of the Statistical Package for the Social Sciences (SPSS) Trends Application version 14.0, it was possible to obtain time series model for all four dependant variables. Statisticians from the Philippe-Pinel Institute of Montreal were also consulted in order to verify the accuracy of the models by verifying the model estimation procedure. Correlograms are analyzed in order to determine whether a model contains an AR, MA, or mixed parameters. The SPSS Expert Modeler automatically does this for the user and gives the resulting model. However, these plots of the autocorrelation function (ACF) and partial autocorrelation function (PACF) plots can also be examined and the models can be identified. Statisticians were consulted to examine the autocorrelations so as to confirm that the types of models were correct and that they best represented the time series data.

3. Methodological Limitations

A major limitation to using time series analysis is that the series must be stationary, meaning that the autocorrelation should be constant over time. Series can be made stationary using various techniques such logging the variables. In this case the four dependant variables were stationary so this was not an issue.

The long number of observations needed is often cited as a limitation in using time series analysis. As previously discussed, the number of cases is a limit in the study, as the sample is under 50. The more observations, the better and it would be ideal to

have closer to 100 observations. Since there was no accurate data collection for homicide statistics prior to 1961 in Canada, it would be practically impossible to obtain a longer set of data.

There were also limitations concerning the macrosocial variables that were chosen. Once again, going back to 1961 is not always possible. For instance, abortion was only legalized in 1969 so no data prior to this was available. Time series analysis completely eliminates the years where there is any missing data, once again diminishing the number of cases. Other than for the abortion rate, only variables where it was possible to have from 1961 to 2004 were retained. For instance, the percentage of single parent families was a variable which was considered, but this is only quantified every four years during census collection and was eliminated as a result. Similarly, the GINI Index of income inequality is only published since 1980, because it is similar to the unemployment rate, it was dropped from the time series analysis as well.

Results

The following section details the results of the various analyses completed. The first section presents the models which resulted from the time series analysis. This is an important step because a model must be found at the statistical level in order to proceed with further analysis, as was mentioned in the methodology. In the second section, the results from the analyses for each type of family homicide over time are presented. This section focuses on the evolution of the four dependant variables, uxoricide, paternal filicide, maternal filicide and parricide from 1961 to 2004 separately. The graphs of the evolution of each type are shown in order to examine certain trends. The results of the time series analysis with the macrosocial variables are also presented for each type of family homicide in order to show which macrosocial variables are significantly associated with the types of family homicide. In the last section the types of family homicide are compared amongst each other.

1. Time series models

Four models were obtained for each of the dependant variables. Using the Expert Modeler Tool in version 14 of SPSS, the parameters of each model were determined. Table I below shows the resulting models for each of the four types of family homicide.

Table I: Uxoricide, Paternal and Maternal Filicide and Parricide Time Series Models

	Type of Model	***Model Parameters***		***Model Fit***		
		Coefficient	*t* Ratio	Q Statistic	p	R^2
*Uxoricide**	(1, 1, 0)	.-558	-4.344	17.770	.403	.386
*Paternal Filicide**	(0, 1, 1)	.669	5.593	14.151	.656	.293
*Maternal Filicide**	(0, 1, 1)	.656	5.365	7.287	.980	.470
*Parricide**	(1, 0, 0)	.470	3.426	18.949	.331	.226

*p. < .01

A statistically significant model was found for all four types of family homicide as seen in Table I above. The residuals were also verified in order to ensure the models correctly specify the data. As previously mentioned, the residuals plots must be randomly distributed for the parameter estimation of the models to be accurate. The plotted residuals for all four models are randomly distributed in this case[10].

The resulting model for uxoricide contains *p* and *d* parameters (1, 1, 0), meaning that the times series auto regressive (there are lingering effects from previous years) and integrated (there are trends in the series). The series was differenced once ($d = 1$) and there is a lag of one year ($p = 1$), meaning that the difference between the rates in 1995 and 1996 for instance, is associated with the difference between 1994 and 1995, and the previous years. The differencing was necessary to improve the stability of the time series, which is one of the requirements of times series analysis[11]. No moving average parameter (*q*), which accounts for random shocks in the data, was found in this model.

[10] The graphs of the plotted residuals can be consulted in Appendix in Figures 8 -11.
[11] The graphs of the time series before and after the models were applied can be consulted in Appendix in Figures 12-19. The improvement in stability is visible.

The R^2 is relatively strong at .386, meaning that 38.6% of the cases are well predicted by the model. The *t* ratio is related to the significance and can be used to compare among the variables, in this case the value of -4.344 is good. The coefficient of -.558 represents the value of the AR (autoregressive parameter) in the equation. The Q statistic is a test that shows whether or not the parameters correctly specify the model; the p value of this statistic needs to be greater than .05 for the model to be valid. The Q statistic is well above .05 as indicated in Table I above.

The parameters of the time series models for both paternal and maternal filicide were the same (0, 1, 1). Their series both have the integrated parameter (*d*) and the moving average parameter (*q*). This means that not only are there trends in the data, but there are random shocks in the time series which need to be considered. They were both differenced once and have a lag of one as well. The maternal filicide model is stronger, with an explained variance of 47.0% compared to 29.3% for paternal filicide.

The parricide time series only contained an auto regressive parameter (*p*), meaning that previous year's rates are associated with present ones. No differencing was necessary, the series was stationary enough. The model (1, 0, 0) is the simplest, but also the lowest R^2 value with 22.6%.

As the results in Table I show, it was possible to find a model for all four variables. They each had some kind of significant trend, they were not simply random. The strongest of the four models is the one for maternal filicide, followed by uxoricide, paternal filicide and parricide. These time series analyses allow us to confirm at a

statistical level that the rates of these four types of family homicide are dependant on past years. Now that statistically significant models are identified it is possible to consider the macrosocial variables to determine any contributing effect they will have on these types of family homicide from 1961 to 2004.

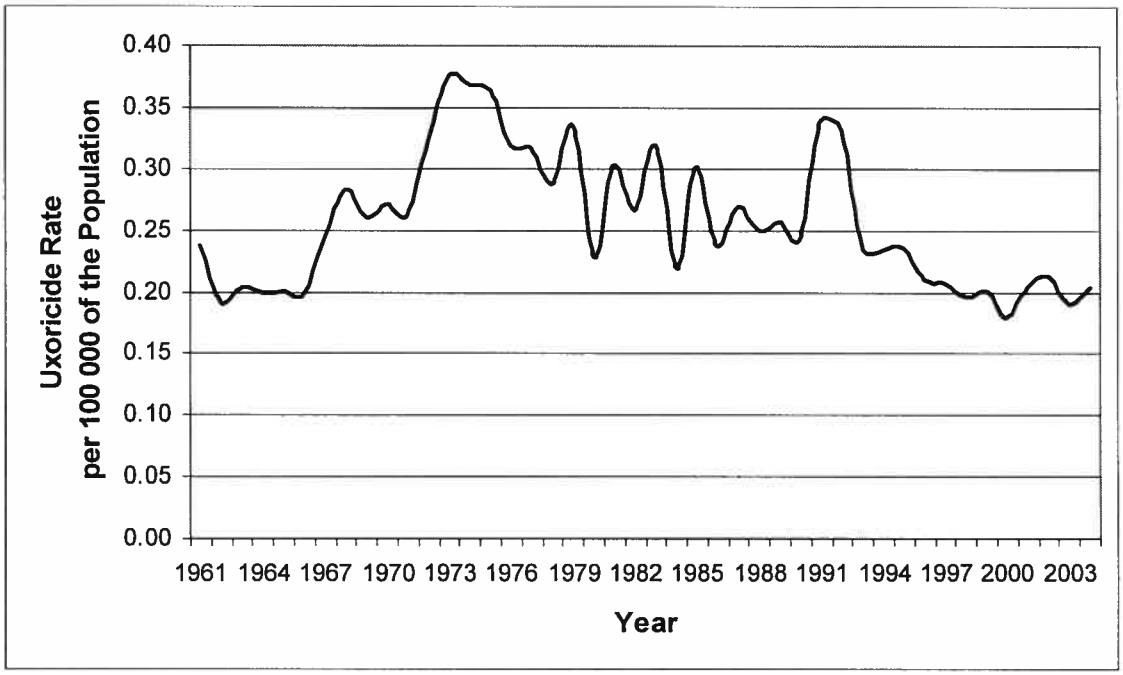
2. Individual Results for Each Type of Family Homicide

The following section presents the graphs of the evolution of each type of family homicide and the results of the time series analysis which include the various macrosocial variables. The macrosocial variables were introduced in separate analyses to see if they had an impact of the homicide rate over time. This type of analysis allowed us to determine whether the fluctuations in the different macrosocial variables (divorce, marriage, teen births, unemployment, etc.) were related to the fluctuations in the different types of family homicide. Uxoricide, paternal filicide, maternal filicide and parricide rates were analyzed along with the following independent variables: the divorce rate, the marriage rate, the number of teen births, the unemployment rate, alcohol consumption (litres per population), the suicide rate, the abortion ratio, the fertility rate. The results for each type of family homicide are presented separately.

2.1 Uxoricide Results

The following figure shows the fluctuations in the rate of uxoricide over the last 44 years.

Figure 1: The Evolution of the Uxoricide Rate from 1961 to 2004



In Figure 1 above, the uxoricide rate per 100 000 of the population varies from approximately .2 to just under .4 from 1961 to 2004. The rate climbed from .2 per 100 000 of the population to a high of .38 in 1973, it then continues on a gradual decrease throughout the eighties and nineties, except for a peak in 1991 and 1992 of .34 and .33 respectively. Since 1996 the uxoricide rate fluctuated between .18 and .21 per 100 000 of the population, returning to the lower rates seen in the early sixties. Table II below summarizes the significant results of the time series analysis results for uxoricide.

Table II: Results of the Time Series Analyses for Uxoricide

	Lag	*Beta*	*SE*	*t*-value	R^2
*Marriage Rate**	1	-.001	.001	-2.597	.352
*Unemployment Rate***	0	.012	.006	1.886	.301
Alcohol Consumption[12]	0	.012	.002	5.548	.505
*Alcohol Consumption**	1	.009	.002	4.372	.505
*Abortion Ratio**	0	-.014	.008	-1.858	.401
*Abortion Ratio**	1	-.013	.005	-2.528	.401

*$p < .05$ **$p < .10$

In Table II above, the marriage rate is negatively associated with the uxoricide rate (t = -2.597, $p < .05$), which means that as the marriage rate increases, the uxoricide rate decreases. The lag is of one and the R^2 is .352. This could mean that as more individuals marry, there are more people in stable relationships and as a result there is less conflict and less uxoricides.

The results in Table II also show that the unemployment rate is a significant variable. The unemployment rate is associated to the uxoricide rate with a lag of zero; however, this relationship is not the strongest. Since this is an exploratory study, significance levels of $p < .10$ were included; the unemployment rate is one such variable that is significant at less than .10 and not at less than .05 like most of the other variables. The relationship is positive, which means that as unemployment increases, so does uxoricide (t = 1.886, $p < .10$). It is possible that periods of

[12] The results were significant using an ARIMA model (0, 1, 0) with a four year delay for alcohol consumption. This means that the impact of any increases or decreases on alcohol consumption only have an effect on the uxoricide rate four years later.

unemployment cause added conflict to relationships, which can lead to more arguments and more uxoricides.

The macrosocial variable that is most associated with the uxoricide rate is alcohol consumption. The relationship is positive, as alcohol consumption increase, uxoricide increases (lag = 0, t = 5.548, $p < .05$; lag = 1, t = 4.372, $p < .05$). The analysis showed that this is the case for both a lag of zero and a lag of one. This means that the alcohol consumption (litres per year) has an effect on the uxoricide rate four years later. The R^2 value is quite high at .505, meaning that slightly over half of the cases are well predicted by the model. Perhaps, this is indicative of problematic or abusive drinking patterns which could lead to more uxoricides in certain situations.

The abortion ratio is also significantly associated with the trends in the uxoricide rate. The relationship is negative (lag = 0, t = -1.858, $p < .05$; lag = 1, t = -2.528, $p < .05$), which means that as the number of abortions per live births increases, the uxoricide rate decreases. The abortion rate is significant for a lag of zero and of one. The model with the abortion ratio explains 40% of the cases in the time series. This could mean that when more abortions occur, there is less conflict in certain high risk relationships, and as a result, less uxoricides are committed.

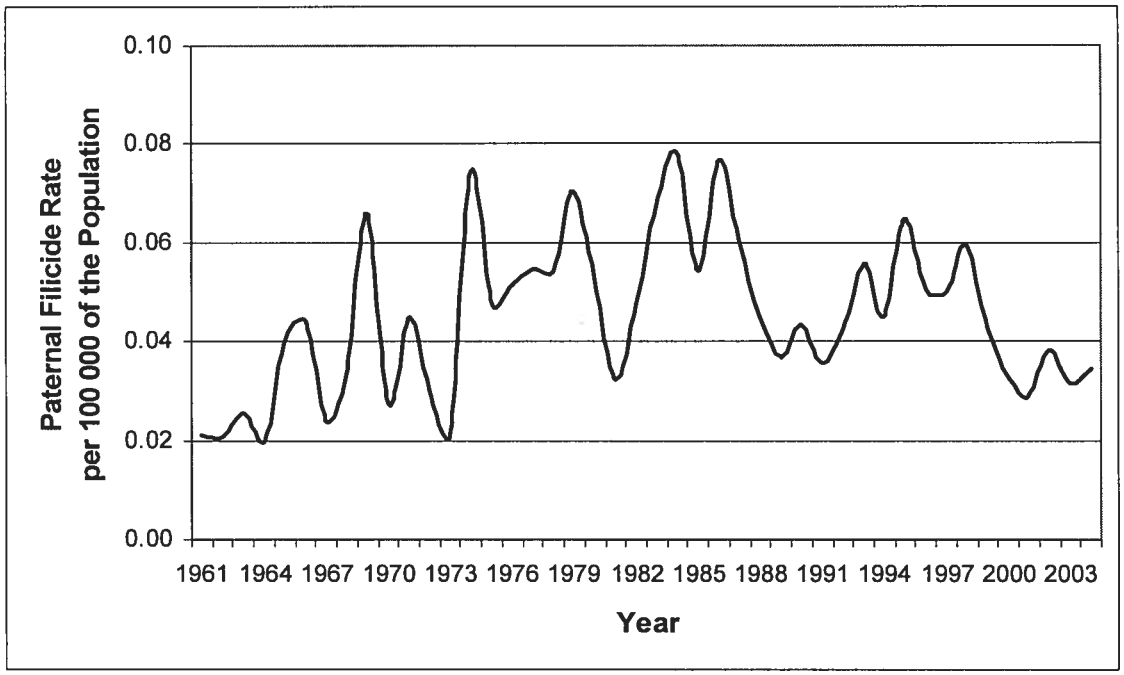
No significant relationship with the uxoricide rate was found for the divorce rate, the number of teen births, the suicide rate and the fertility rate. It was previously hypothesized that the divorce rate should be associated with the uxoricide rate; however, it is possible that at the macro level, the relationship is not revealed

because divorce can also act a protection measure for some women. The suicide rate was also hypothesized as being related to the uxoricide rate over time, since mental health issues are prevalent among men who kill a spouse; perhaps the relationship did not materialize because suicide is not the best measure of mental health in society. For the other two variables which were not significant, teen births and the fertility rate, there was no hypothesized relationship with the uxoricide rate.

2.2 Paternal Filicide Results

Figure 2 below shows the fluctuations in the rate of paternal filicide over the last 44 years.

Figure 2: The Evolution of the Paternal Filicide Rate from 1961 to 2004



The paternal filicide rate is relatively stable over the time period shown, fluctuating between .02 and .08 per 100 000 of the population. The rate peaks in the seventies and eighties, but seems to be on a decline in the last two decades.

Table III below depicts the results of the time series analysis for the paternal filicide rate and the different macrosocial variables.

Table III: Results of the Time Series Analyses for Paternal Filicide

	Lag	***Beta***	***SE***	***t*-value**	**R^2**
*Divorce Rate**	0	.000	.000	2.726	.412
*Divorce Rate**	1	.000	.000	1.857	.412
*Unemployment Rate***	1	-.005	.002	-2.200	.407

*$p < .05$ **$p < .10$

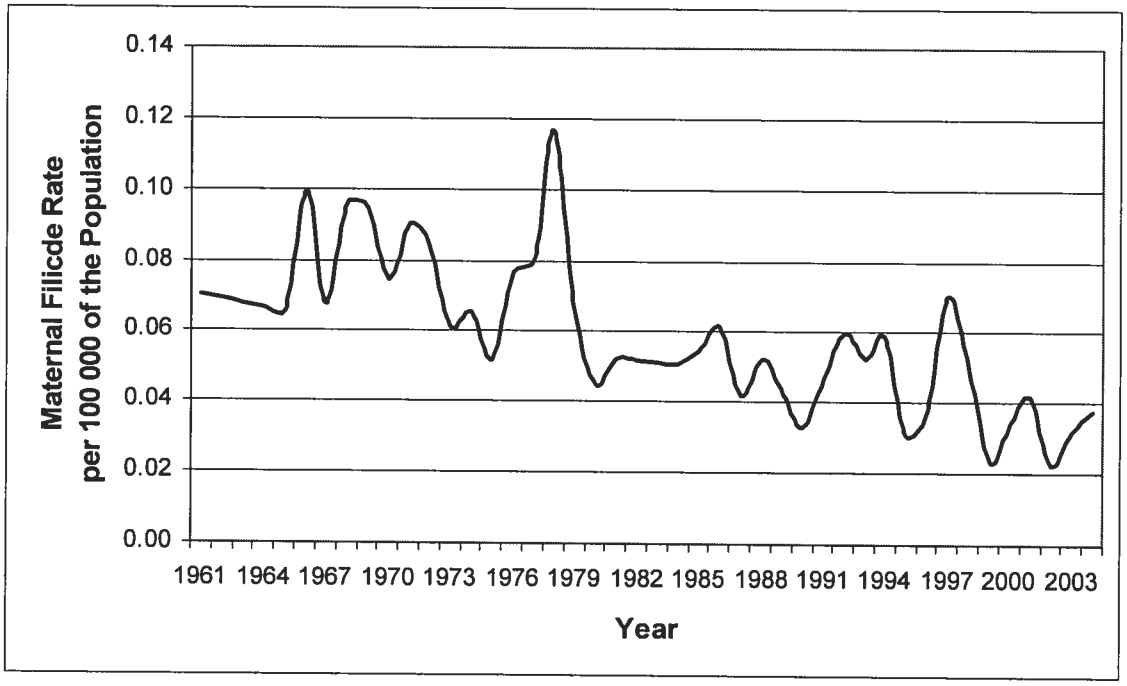
As Table III indicates, only the divorce rate and the unemployment rate were significantly associated with the paternal filicide rate from 1961 to 2004. The divorce rate was positively associated with the paternal filicide rate, with a lag of zero and of one (lag = 0, t = 2.726, $p < .05$; lag = 1, t = 1.857, $p < .05$). Therefore, the more divorces that occur, the more men kill their children. The model accurately predicts 41.2% of the cases. Divorce is a definite stressor in a relationship that involves children. It is possible that when a divorce occurs and the ex-husband does not accept it, especially if the woman has begun a new relationship, he may take it out on the children in order to get revenge with his ex-wife.

The unemployment rate is also associated with the paternal filicide rate as shown in Table III, but the relationship is negative (t = -2.200, $p < .10$). For this time series, as the unemployment rate increases, the paternal filicide rate decreases, this is contrary to what was predicted. However, the significance is less than .10, instead of being less than .05. None of the other macrosocial variables that were tested yielded statistically significant results for paternal filicide. Earlier, it was hypothesized that alcohol consumption and suicide would be associated with the paternal filicide rates; however, it is possible that these are not the primary factors acting on filicidal men.

2.3 Maternal Filicide Results

The following figure shows the fluctuations in the rate of maternal filicide over the last 44 years.

Figure 3: The Evolution of the Maternal Filicide Rate from 1961 to 2004



In Figure 3 above a declining trend is visible for the maternal filicide rate, except for a peak in 1978 which reached a rate of .12 maternal filicides per 100 000 of the population. The rate stays at an average of around .07 until 1980, after which time the rate remains closer to .04 until 2004. The following table shows the results of the time series analysis for maternal filicide.

Table IV: Results of the Time Series Analyses for Maternal Filicide

	Lag	*Beta*	*SE*	*t*-value	R^2
*Abortion**	1	.004	.002	2.224	.291

*$p < .05$ **$p < .10$

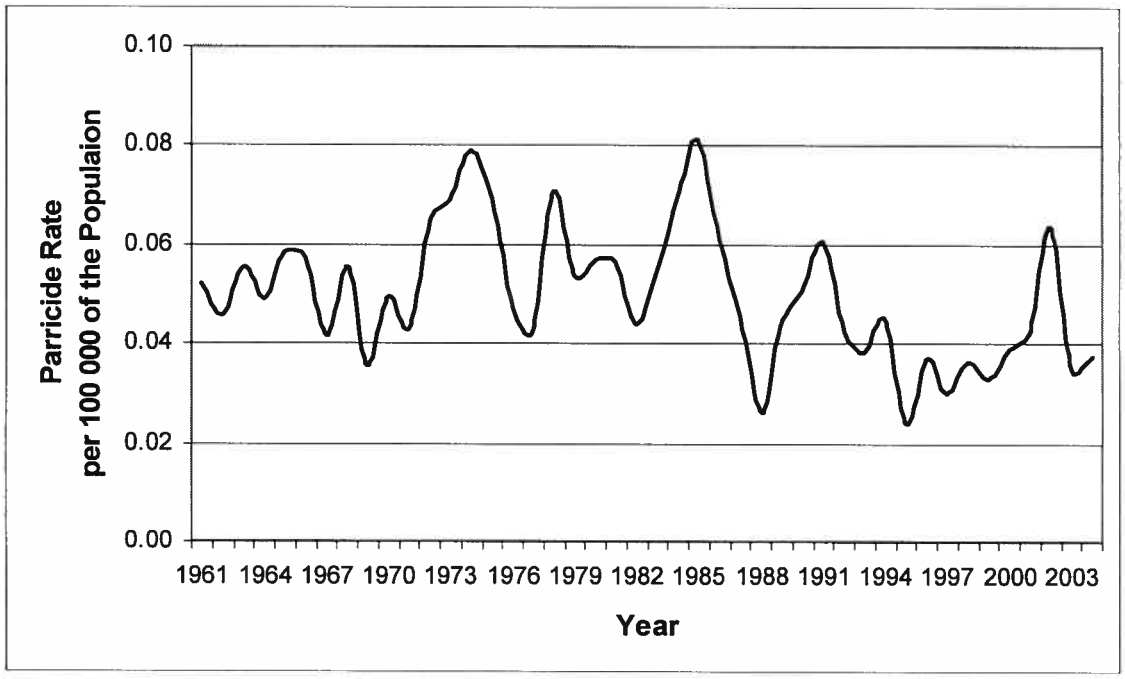
The results in Table IV indicate that the abortion rate is statistically associated with the maternal filicide rate. The R^2 value is .291 which is not very high. The relationship is positive (t = 2.224, $p < .05$), meaning that as the abortion rate increases, the maternal filicide rate increases. The direction is not consistent with earlier hypotheses that as abortions increase, maternal filicides should decrease because there are less unwanted children.

No other variables were significantly associated with the maternal filicide rate. Teen births were especially thought to have been a macrosocial variable which would have yielded significant results. Not only do teen mothers generally not plan their pregnancies, but they are usually unprepared for having children and are in unstable relationships. Suicide was although hypothesized as being associated with maternal filicide; however as seen in Table II and Table III, it was not a significant variable for uxoricide or paternal filicide either.

2.4 Parricide Results

The following figure shows the fluctuations in the rate of parricide over the last 44 years.

Figure 4: The Evolution of the Parricide Rate from 1961 to 2004



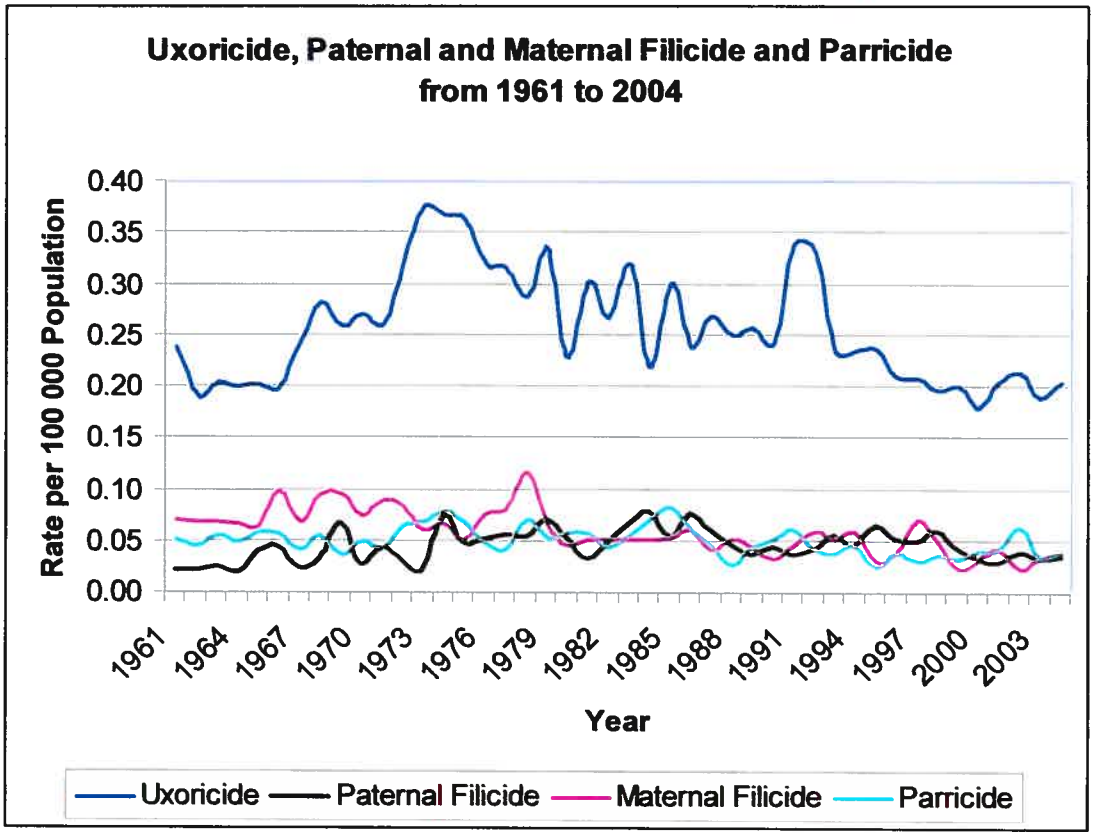
The parricide rate shows an overall decreasing trend from 1961 to 2004 as seen in Figure 4 above. This curve peaks at .08 in the mid seventies and early eighties, only to continue on a somewhat decreasing trend which mainly stays around .04 per 100 000 of the population in the last fifteen years.

The time series analysis indicated that none of macrosocial variables tested were associated with the parricide rate from 1961 to 2004. The unemployment rate and the fertility rate were the two variables that were hypothesized to be associated with parricide.

3. A Comparison of the Four Types of Family Homicide

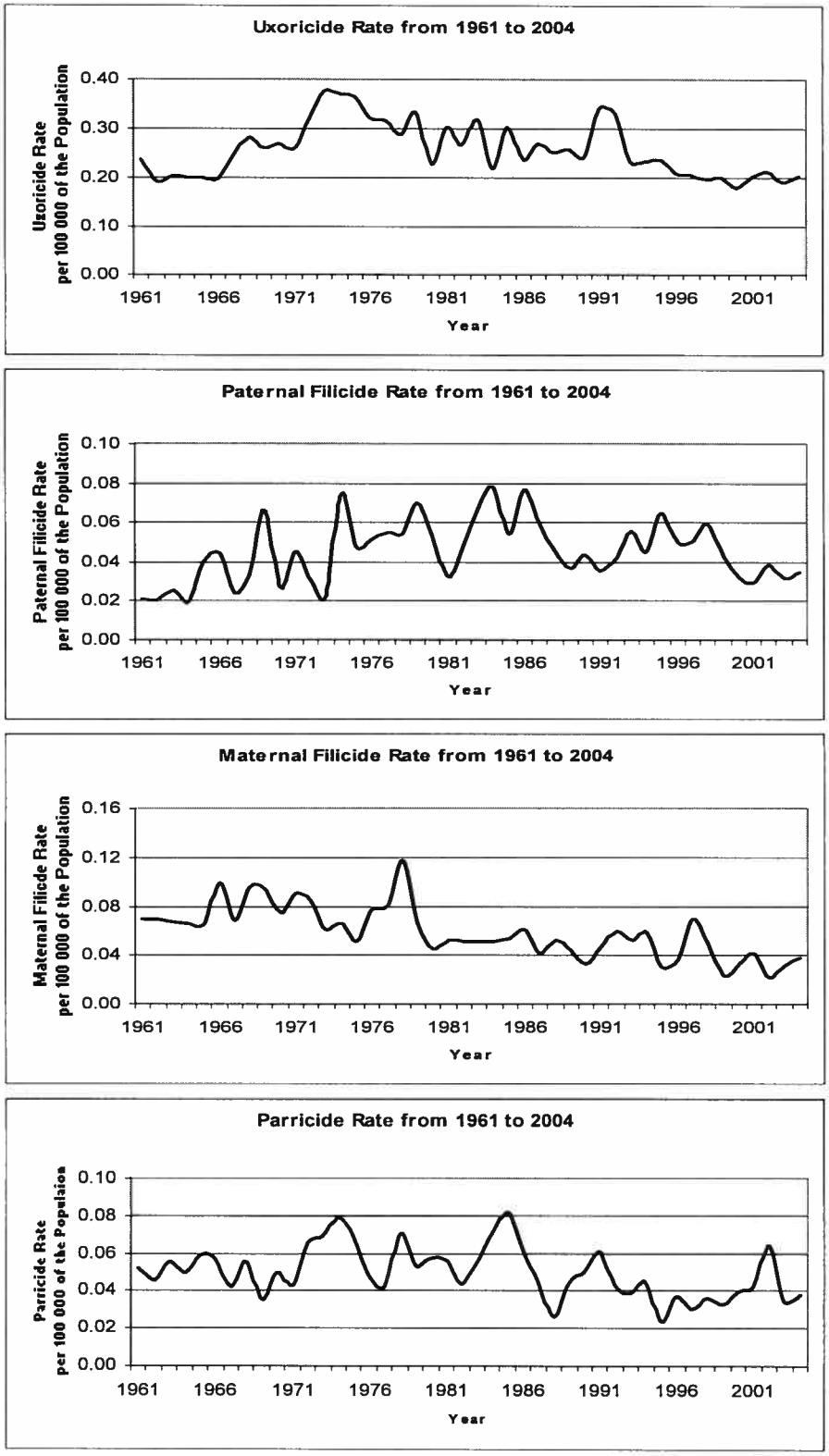
The following section compares the trends of the four types of family homicides. Due to the large differences in the frequencies of the variables two graphing techniques were necessary. The first, in Figure 5 below, shows all four series in one.

Figure 5: The Evolution of Four Types of Family Homicide Rates from 1961 to 2004



In the figure above, all four types of family homicide are depicted in the same graph. The other three types of family homicides occur much less frequently than uxoricide, and thus have much smaller rates. Due to this, the scale of the graph is affected. However, the main observation which can be made is that all four types seem to be on a declining trend. Below in Figure 6, all four types of family homicide are presented one after the other, facilitating comparison.

Figure 6: The Evolution of Uxoricide, Paternal Filicide, Maternal Filicide and Parricide



There are definite differences in the trends for the types of family homicide as shown in the Figure 6 above. The evolution of all four types is different, some are more stable than others, however, all four seem to have in common that despite previous increases, and their rates all remain relatively low in the last 10 to 15 years. Similar declining patterns were found in the literature in Canada (Gannon, 2004; Silverman & Kennedy, 1993). Another similarity shared by all four of the time series is a peak of some kind in the seventies and the eighties. These two decades seem to be the most violent for family homicides in comparison to the rest. It can be said that we are not currently in a rising period of family homicide. All four types have either returned to similar levels as those seen in the early sixties or they have gone below them. The uxoricide rates have returned to the rates seen in the sixties, the paternal filicide rates are closer to the rates seen in the sixties than they have been in the last thirty years, the maternal filicide rates have been lower that they were in the sixties for the last twenty years or so, and the parricide rate is also slightly lower now than in was in the sixties. More years would be needed to say for certain what the cyclical pattern is, but especially for maternal filicide, it is clear that the rates have been on the decrease. Perhaps this is an indication of improvements in screening for postpartum depression and the fact that more support and resources are in place now as compared to 30 or 40 years ago.

Discussion

The results indicated that some of the macrosocial variables do have an impact on certain types of family homicide over time. Significant associations were specifically found for divorce, marriage, unemployment, alcohol consumption and abortion. The following section explains the results that were expected as well as those that were not for uxoricide, paternal filicide, maternal filicide, and parricide. Next, an overall comparison of the results is completed. Finally, the limits of the study are presented.

1. Uxoricide

The relationship between divorce and uxoricide at the macro level was expected to be positively related. At a time in society where there are many couples ending their marriages, there is bound to be more conflict, more people starting new relationships, and as a result more uxoricides. Uxoricides also often occur between couples who are unstable and in situations of conjugal violence. However, the relationship between the divorce rate and the uxoricide rate was not significant from 1961 to 2004 in this analysis. One possibility is that divorce is a very dangerous factor for the woman the year of the actual divorce, but two or three years later, divorce could act as a protection factor (Cusson, 2006). This could explain why, at a statistical level, no significant relationship can be seen. It is possible that the effects cancel each other out at the macro level. Divorce can push a man to kill in the immediate situation, but can also protect later on, once the woman is out of the dangerous relationship and the man has moved on.

On the other hand, it was hypothesized that marriage would be negatively related to uxoricide at the macro level, because in a society where more people are settling down and beginning stable relationships, it is likely that there will be less uxoricides. This hypothesis is confirmed at the statistical level with the time series analysis, the marriage rate is negatively associated with the uxoricide rate. Although marriage is not exclusively a measure of stability in a relationship, couples who marry are generally in more serious, longer term and more stable relationships. At the macro level, an increasing marriage rate can indicate that there are more people who are solidifying their relationships. The fact that as marriage rates decreased, uxoricide rates increased, supports this idea. This is also supported by the literature which indicates that women in common law relationships are murdered more often than those who are married (Boisvert & Cusson, 1999).

The hypothesis was suggested that when the unemployment rate is high in society, uxoricide rates could be high as well. Periods of unemployment are often times of great stress in families; these men may have either lost their jobs or are having trouble keeping their jobs. When the problem is compounded by other problems such as alcohol abuse or marital discord, the probability of conflict is even more elevated. The time series analysis indicated that the unemployment rate is positively associated with the uxoricide rate. This positive relationship was also found by other authors in Canada for overall homicide rates and unemployment (Pottie Bunge & al., 2005). Uxoricide rates increased as unemployment increased, which is definitely an added stressor in a troubled relationship. Therefore, it is possible that there are some common variables which influence uxoricide as well as overall homicide.

Alcohol consumption at the macro level was expected to be associated with uxoricide rates over time. Increased periods of alcohol consumption could mean more problematic drinking in individuals, or just more frequent drinking which could simply mean more opportunities where potential offenders have their inhibitions lowered. When a violent partner is under the influence of alcohol, the chances that an argument will have deadly consequences are even higher. Alcohol can remove certain inhibitions in already violent men. Alcohol consumption is positively associated with the uxoricide rate. This result supports the data in Quebec which indicated that a large number of uxoricide offenders were under the influence of alcohol (Boisvert & Cusson, 1999). As alcohol consumption increased, so did uxoricide rates.

Suicide was not related to uxoricide or the other three types of family homicide. It was expected that at the macro level, suicide could be a good indicator of mental health issues in society and would be positively related to uxoricide. If more and more people are suffering from serious mental health issues which would be represented by suicide, then the uxoricide rate would follow during those periods of high suicide rates. One explanation for this not showing up in our analysis is that suicide is not the best indicator of mental issues in society. Suicide is complex; it has its own set of factors and causes which influence it, possibly making it less ideal as a variable in this case. Perhaps another indicator of mental health would have yielded significant results. Another possible explanation could be that some of the men who may have thought of killing their spouse, committed suicide instead and as a result, the relationship was not strong enough to be seen at a statistical level. Moreover, not all patterns that are found at the micro level are reproduced at the macro. Suicide is

a multifaceted issue. Suicide was not associated with uxoricide even though over 30% of men kill themselves after killing their spouses (Gannon, 2004). Nor was suicide associated with any other type of family homicide, even though offenders of uxoricide, paternal filicide and maternal filicide often take their lives after taking the life of their family member (Langlois & Morrison, 2002; Gannon, 2004).

Abortion was expected to be associated much more strongly with maternal filicide than with uxoricide at the macro level. In the literature review, it was explained that the theory behind the abortion crime link involves a very long lag. A longer time frame would allow for the verification of Donohue and Levitt's (2001) theory, which states that abortion eliminated a certain number of individuals who would have grown up in pro-criminal environments. The increase in abortion could consequently reduce the potential number of future criminals. A lag of at least 20 years would be needed to verify this. One of the problems with abortion is that the data is only available from 1970 until the present. Prior to this, abortion was illegal and to the author's knowledge no valid statistics exist which document the number of abortions during the sixties. Time series analysis completely eliminates the years where there are missing cases, so the analyses completed with the abortion ratio have 35 instead of 44 years of data. As a result, 35 years of data is insufficient to confirm their theory, and 35 years is also little low for this type of statistical technique to be completed; generally speaking, 50 is considered the minimum for time series analysis (Tabachnick & Fidell, 2000). Donohue and Levitt's (2001) theory that an impact would be found in 20 years was impossible to test with this data set, but results were found with the present data, without a substantial lag. Therefore, it is possible that with a longer time series, a relationship will still be found for this variable. In this

study, the abortion rate is significantly and negatively associated with uxoricide rates. An unwanted child in a troubled relationship is certainly an added stressor. Perhaps, more women had abortions meaning there were less unwanted children, and therefore less stress in the relationship to set off a potential uxoricide offender. This scenario would have to be examined at the micro level in order to be validated.

The analysis on uxoricide yielded four significant relationships, a greater number than for the other types of family homicide. The incidence of uxoricide greatly outnumbers the others. When something occurs more often, the time series is likely to be more stable and less susceptible to spikes in the data causing spurious relationships or missing important ones.

2. Paternal Filicide

The relationship between divorce and paternal filicide at the macro level was expected to be positively related. When there are many divorces in society at a certain time period, it follows that there is also more conflict, and perhaps more individuals committing filicide. The relationship between the divorce rate and the paternal filicide rate was positive, meaning that as divorce rates increased, more men killed their children. This is consistent with the literature which indicates one of the most important motivations men give for killing their child is revenge (Marleau & al., 1999). These men often do not deal well with the idea that their marriage is over. If there is another man in the picture, this only serves to increase their jealousy and anger. They often decide to kill their child as a way to make their ex-spouses suffer. The results and the literature therefore support this scenario.

The hypothesis at the macro level for the relationship between the unemployment rate and paternal filicide was that it should have been positive, as it was for uxoricide. However, the direction of relationship between the unemployment rate and paternal filicide is negative. This result means that as unemployment increases, paternal filicide decreases. The opposite relationship was predicted, because as with the explanation given for uxoricide, not having a job should be a stressor. However, when the unemployment is high, it means that it is high for both men and women. Women also lose their jobs in times of economic difficulty, especially if they have part-time or less secure jobs. Perhaps, in times of high unemployment women are forced to stay home and raise their children more often. Cohen and Felson (1979) state that the absence of a guardian is a necessary condition for a crime to occur, but if more women stay home with their children, there would be more guardians present. As a result, there could be less opportunity for fathers to kill their children. If the woman is always home, the father would have less access to his children, even if he was motivated to kill them. Men could also be more likely to turn their anger towards their spouses than towards their children when they are jobless, seeing as the relationship was positive for unemployment and uxoricide.

Paternal filicide was not expected to be associated with teen births or fertility, but the argument was made that it should be associated with alcohol consumption and suicide. Potential issues with the suicide rate as an indicator of mental health were previously explained in the uxoricide section. However, alcohol consumption was hypothesized to be related to paternal filicide at the macro level similar to uxoricide. Whether people are drinking more abusively or just more often, if people are consuming more alcohol, it is likely that the rate of paternal filicide will increase when

alcohol consumption increases, and decrease when alcohol consumption decreases. The relationship was not found in this analysis. For the paternal filicide situation, it is possible that the link does not exist at the macro level even though the majority of men consume alcohol before committing the filicide (Campion & al. 1988). Perhaps, paternal filicide is less of an issue between the offender and his direct victim, his child, but more to do with the mother of the child that the offender is trying to make suffer.

3. Maternal Filicide

The maternal filicide analyses did not yield many significant results at the macro level. Yet when studies include all types of child homicide, not exclusively filicides, there often are significant results. Straus (1987) found that divorce was significantly associated with child homicide, and Gartner (1991) found that their teen births variable was a very strong variable for child homicide. Neither of these two variables was significantly associated with the filicide rate in our analysis. This could mean that it is important to have pure databases with one kind of homicide that has a specific dynamic; otherwise the results could be misleading or spurious.

The teen births variable was hypothesized to be positively associated with the maternal filicide rate at the macrosocial level. As teen births increased, the number of maternal filicide was thought to increase. When many teens are having unplanned pregnancies and are in unstable relationships, it is possible that more of them will decide to end the lives of their child. This relationship was simply not found at the macro level. Although, a specific type of filicide, unwanted child (Resnick, 1969)

exists which fits this pattern, and many cases of filicide are committed by young single mothers (Marleau & al. 1995) it does not necessarily mean that this relationship will appear over time.

The suicide rate was also hypothesized to be associated with the maternal filicide at the macro level. However, as mentioned previously, this may not be the ideal indicator of mental health. An interesting variable to examine would be the number of antidepressants prescribed each year, especially for maternal filicide. Perhaps, as the number of antidepressants has increased in the last couple of decades, the number of maternal filicides has decreased. From 1981 to 2002 the prescription of antidepressants in Canada has increased 353% from 3.2 million in 1981 to 14.5 million in 2000 (Hemels, Koren, & Einarson 2002). These authors suggest that the increase can in part be attributed to an increase in the awareness and acceptance of mental health issues. This would have to be examined with maternal filicide to see if the decrease in maternal filicide since the eighties is related to the drastic increase in the prescription of antidepressants.

The only significant variable found for maternal filicide is the abortion ratio. However, the direction of the relationship is contrary to what was predicted. The relationship is positive, meaning that as abortion increases, so does maternal filicide. The hypothesis initially given was that abortion was a means to reduce the number of unwanted children and as a result the number of potential maternal filicides. An important motivation given by mothers who have killed their children is that the child was unwanted (Marleau & al., 1995). However, the opposite result was found. Perhaps, some mothers reason that having an abortion or committing filicide amount

to the same thing. Whatever their motivation (unwanted, altruistic), they believe that the child should not live. As abortion in society increases over time and is more and more socially acceptable, they may believe that the life of the child is not worth anything, or that filicide and abortion are simply equivalent. This line of thinking would most definitely have to be confirmed at the micro level. It would be interesting to see what percentage of filicidal mothers had abortions in the past in order to further examine this idea.

The variable which was most expected to be associated with maternal filicide was the number of teen births. The literature indicated that young mothers are more likely to commit filicide (Silverman & Kennedy, 1988). Adolescent mothers are also more likely to not have planned for or wanted the child, which is an important motivation that these women give for committing filicide (Marleau & al., 1995). Adolescent mothers not only do not want their children, but when they do attempt to raise them they are faced with all kinds of obstacles and stressors that can lead to filicide. They are also in much less stable situations than older mothers who are prepared for having a child. There are many women in society who cannot conceive children. Women often have to wait several years before being able to adopt a child. Perhaps, teenage mothers see adoption as a viable and preferred option instead of filicide or abortion; this variable would have to be further examined as well.

4. Parricide

Parricide was not associated with any of the macrosocial variables. It was initially hypothesized that the parricide rates would be associated with the unemployment rate, alcohol consumption and the fertility rate.

Abuse is one of the main reasons given for why offenders kill their parents (Shon & Targonski, 2003). Men who commit parricide often live with their parents and are unemployed (Marleau & al. 2003). It was suggested that when unemployment was low, these potential parricide offenders would have the financial means to leave their parents home, which would distance them from their potential victim and give them less of an opportunity to commit parricide. Perhaps, the fact that parricide offenders are very often unemployed is not related to job availability, but to their mental state, seeing as this group suffers from mental health issues more than the rest. This would explain why at the macro level, no relationship can be found between unemployment and parricide. Perhaps parricide is more of a psychological phenomenon. There are always a certain number of people affected with psychological problems in society, so maybe there will always be certain number of parricide regardless of the variation in macrosocial factors. Their own mental instability is probably more related to the frequency of parricide acts over time.

Alcohol consumption was also hypothesized to be associated with the parricide rate over time, as was the fertility rate. However, if parricide is more related to the offenders' mental instability, these relationships will not materialize. Although alcohol can reduce the inhibitions of a potential offender, the underlying cause of the mental

health issues, such as uncontrolled schizophrenia (hallucinations, paranoia) are probably more influential. Similarly, the fertility rate was thought to be inversely associated with the parricide rate. The idea was that the higher the fertility rate is, the more siblings one is likely to have. A sibling who intends to kill a parent can be deterred by the presence of additional siblings. However, it is very hard to know from this variable what people's living situations are. Perhaps a better variable would have been the number of people per household. The problem is that this variable is very hard to obtain on a yearly basis from 1961 to the present.

5. Overall Comparison

Concerning the trends which were graphically presented for the four types of family homicide; it was found that we are currently in a decreasing phase. An American study which showed uxoricide and parricide trends from 1976 to 1998 showed a similar decreasing trend, however there seemed to have been much less fluctuation in the US than here during that time period (Shon & Targonski, 2003). In Canada, compared to other types of crime such as property crimes, the trends have some similarities. For instance, according to Statistics Canada data, the rate per 100 000 of the population for total property crimes from 1977 to 2004 for Canada also shows that we are currently in a period of decrease[13]. However, the peak for this curve was the early eighties to the mid-nineties which is slightly later that what was seen here for the specific types of family homicide. Similarly, the total homicide for this 1977 to 2004 also shows a decrease in the last decade[14].

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[13] See Figure 20 in Appendix for this graph
[14] See Figure 21 in Appendix for this graph

More specifically, considering that the trends were more or less stable for parricide compared to the other types, it is possible that parricide is not as influenced by outside factors (divorce, unemployment), but that it is a more stable phenomenon. Of the four types studied, perhaps parricide is the one type which can be attributed to psychological problems, which are less affected by macrosocial factors.

Perhaps the underlying problems of specific types of family homicide are also managed internally, by the family dynamic. This could explain the lack of significant dependant variables in some cases, and the presence of significant ones in others. Maybe the family unit should be regarded as a distinct unit within society. Some families may form a sort of protection form the external world, so that the macrosocial factors do not have as much of an effect on these types of crime. Perhaps they are not as influenced by the large social structure. The family unit protects against any external influence in these cases. It is likely that these types of family homicides are more affected by the internal problems in the family unit such as bad relationship, jealousy, abuse, etc.

Some of the results found supported the literature, others were simply not found, while still others were the opposite of what was previously found by others. Even though most of the authors did not disaggregate the homicide rates in their macrosocial studies, there are still grounds for comparison. For instance, in their macrosocial study of overall homicide rates in Canada from 1962 to 2003, Pottie Bunge and al. (2005) found that the unemployment rate was a positive and significant variable. However, in this study, when the types of family homicide were disaggregated, the relationship only remains positive and significant for uxoricide, for

paternal filicide, the relationship is actually negative, and the significance disappears completely for maternal filicide and parricide. This demonstrates the importance of disaggregating so as not to miss any relationships.

6. Limits

At this point, the results can be considered preliminary. Despite the fact that a time series of 44 years is longer than most macrosocial studies on family homicide, the data set would need to be longer than 50 in order to yield more significant results. Although a large number of variables were tested in this study, it would be interesting to examine additional ones, more particularly with this type of statistical technique. The main problem in this kind of study is finding the data. A large number of variables are not available on a yearly basis or are not consistently documented.

One major, yet unavoidable obstacle specific to the study of filicide is the number of unknown cases of filicide. The murder of an infant is much easier to hide than that of an adult. Many cases of SIDS (Sudden Infant Death Syndrome) are suspected filicides. Without adequate proof, law enforcement officials are often helpless. One can assume that because of advancements in forensic sciences, cases of murder are more often uncovered than not, but it is extremely difficult to tell. In a study such as this one, it is possible that the number of filicides, especially in the sixties and seventies, are probably undercounted to a certain degree.

Conclusion

This study demonstrated the interest in disaggregating the different types of family homicide and examining their trends over time. At first glance, they may seem similar and stable which is why they are often grouped together, but there are significant differences in the types of family homicide, which supports in part what the micro research indicated. Considering all of these differences in the relationships with the macrosocial variables and the types of family homicide, it seems that studying them separately can be valuable. Many authors aggregate the data on family homicide, but perhaps relationships that are in opposite direction, such as unemployment, which was positive for uxoricide, but negative for paternal filicide, would not have been revealed. The evolution of the four types is different. Graphically, they are different and statistically the parameters of the models were different[16].

Only some of the macrosocial variables were associated with uxoricide, paternal and maternal filicide, and none were associated with the parricide rate. Regardless, the results point to interesting directions for future research, such as for divorce and marriage, unemployment, alcohol consumption, and abortion. Further research needs to be completed to examine exactly what is occurring with these types of variables. For instance, the relationship between uxoricide, divorce and marriage would have to be further examined; perhaps by looking into a statistical way to separate the opposite effects these two variables can have on uxoricide. Unemployment could also be examined further in order to understand why it is

[16] As was described in the methodology section uxoricide is an autoregressive integrated model: (1, 1, 0), paternal and maternal filicide are integrated models with moving averages: (0, 1, 1), and parricide is an auto regressive model: (1, 0, 0).

associated to some types of homicide and not others, as well as why and how it is associated to the overall homicide rate. Moreover, it would be important to examine the significance of the four year delay for the alcohol consumption variable to have its effect. Perhaps there is also a way to have an alcohol variable which would better reflect alcohol abuse. Abortion is also an interesting variable which has gained popularity in recent years. Donohue and Levitt's (2001) theory on abortion would also be interesting to examine once enough time has passed to have an appropriate lag. Several interesting research projects could be completed simply to examine the link between abortion and different types of crime in Canada.

A different mental health indicator would be an important variable to examine, especially for parricide, but also for maternal filicide, both of which psychological problems are prevalent. The author was not able to find data on a yearly basis for a sufficient enough period of time in order to be able to test this hypothesis. It would be important to do so in the future, as psychological problems are often associated with family homicide. A measure such as admissions in psychiatric hospitals could possibly be useful. The obstacle to overcome is to find yearly national data which goes back as far as the sixties and which is comparable over time.

The models were far from completely explaining the data, however, at a macro level, the results are interesting. It is useful to know that there are external factors which can influence family homicide (divorce, marriage, unemployment, alcohol consumption, abortion). Other factors definitely remain which influence the occurrence of this crime. This type of research should be continued so that the social factors which do impact family homicide can be identified and perhaps prevention

measures be applied afterwards. For now, the trends of all four types of family homicide studied here seem to indicate that we are in a decreasing period. Should the rates starts to increase however, it would be valuable to know what can be done on a larger scale. While many studies examine the specific motives for why a mother kills her child or a husband kills his wife, the data from these micro level studies is usually obtained from psychiatric institutions and therefore tends to only be representative of a certain type of offender or situation. The benefit of macrosocial research is that the results can be more generally applied and an overall picture obtained. For instance, the length or severity of prison sentences, the impact of new laws and the government expenditure on social services could all be examined using this type or research to verify their effectiveness. In the current climate of gun control, it would be very interesting to see if gun control laws such as Bill C-17 are efficient. In 1991, major modifications were made to the Criminal Code of Canada which significantly affected firearm legislation. The implementation of Bill C-17 in 1991, the Firearm Control Initiative, required that a substantial amount of personal information be collected as well as a 28 day obligatory waiting period be fulfilled in order to obtain a firearm (Dauvergne, 2004). Using time series analysis, it would be possible to measure the impact of these types of legislations on homicide and other crimes. Knowing the efficiency of such measures is an important part of effectively preventing future homicides.

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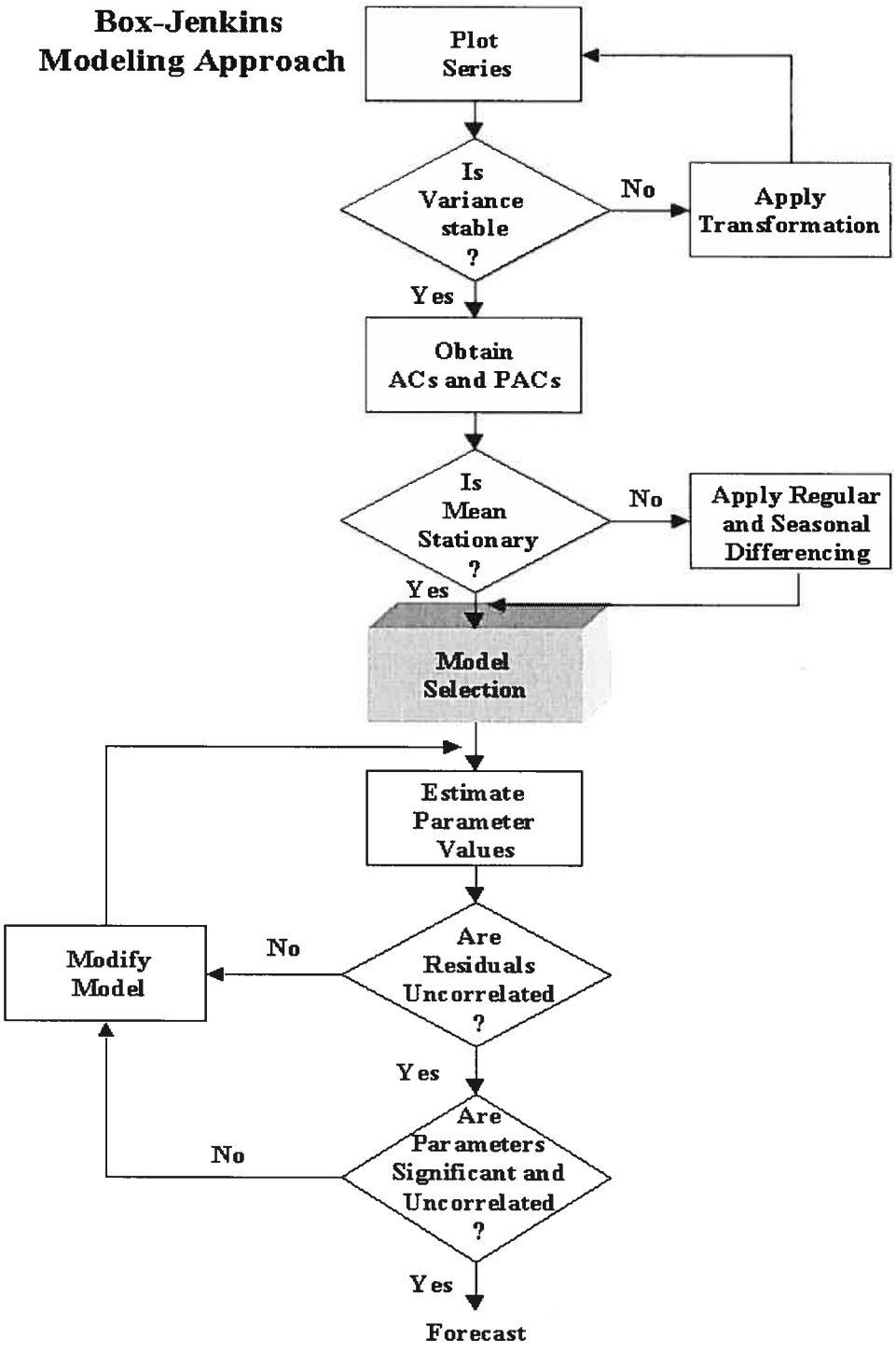
Appendix

Table V: Estimating the Values of Uxoricide, Paternal Filicide, Maternal Filicide and Parricide from 1961 to 1979

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
# of Uxoricides																			
Without manslaughter	40	32	35	35	36	36	46	55	51	54	54	68	81	80	79	70	72	66	80
Real totals	-	-	-	-	-	-	-	-	-	-	-	-	-	84	84	75	75	69	81
Estimated totals	43.5	35.5	38.5	38.5	39.5	39.5	49.5	58.5	54.5	57.5	57.5	71.5	84.5	83.5	82.5	73.5	75.5	69.5	83.5
# of Paternal Filicides																			
Without manslaughter	2	2	3	2	6	7	3	5	12	4	8	5	3	16	8	12	10	11	15
Real totals	-	-	-	-	-	-	-	-	-	-	-	-	-	17	11	12	13	13	17
Estimated totals	3.8	3.8	4.8	3.8	7.8	8.8	4.8	6.8	13.8	5.8	9.8	6.8	4.8	17.8	9.8	13.8	11.8	12.8	16.8
# of Maternal Filicides																			
Without manslaughter & infanticide	6	6	6	6	6	13	7	13	13	9	13	12	7	8	10	10	11	16	12
Real totals	-	-	-	-	-	-	-	-	-	-	-	-	-	*15*	*12*	*18*	*19*	*28*	*16*
Estimated totals	12.8	12.8	12.8	12.8	12.8	19.8	13.8	19.8	19.8	15.8	19.8	18.8	13.8	14.8	16.8	16.8	17.8	22.8	18.8
# of Parricides																			
Without manslaughter	8	7	9	8	10	10	7	10	6	9	8	13	14	15	14	10	9	15	13
Real totals	-	-	-	-	-	-	-	-	-	-	-	-	-	18	16	11	10	17	13
Estimated totals	9.5	8.5	10.5	9.5	11.5	11.5	8.5	11.5	7.5	10.5	9.5	14.5	15.5	16.5	15.5	11.5	10.5	16.5	14.5

Figure 7: Steps to the Box Jenkins Method[16]



[16] Source: http://obelia.jde.aca.mmu.ac.uk/resdesgn/arsham/opre330Forecast.htm#rboxjenkm

Figure 8: Residual Plot for the Uxoricide Model

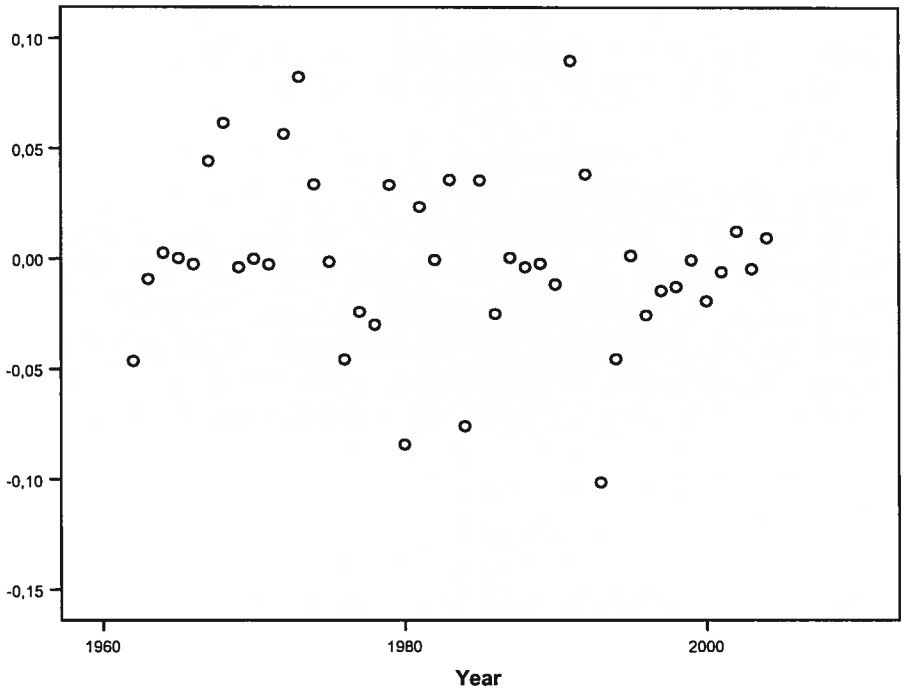


Figure 9: Residual Plot for the Paternal Filicide Model

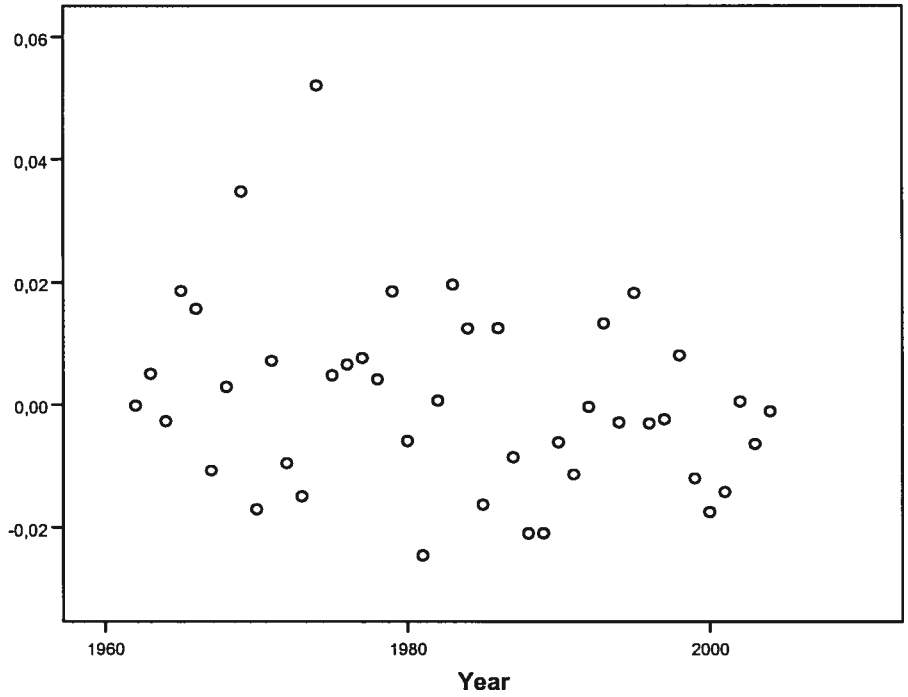


Figure 10: Residual Plot for the Maternal Filicide Model

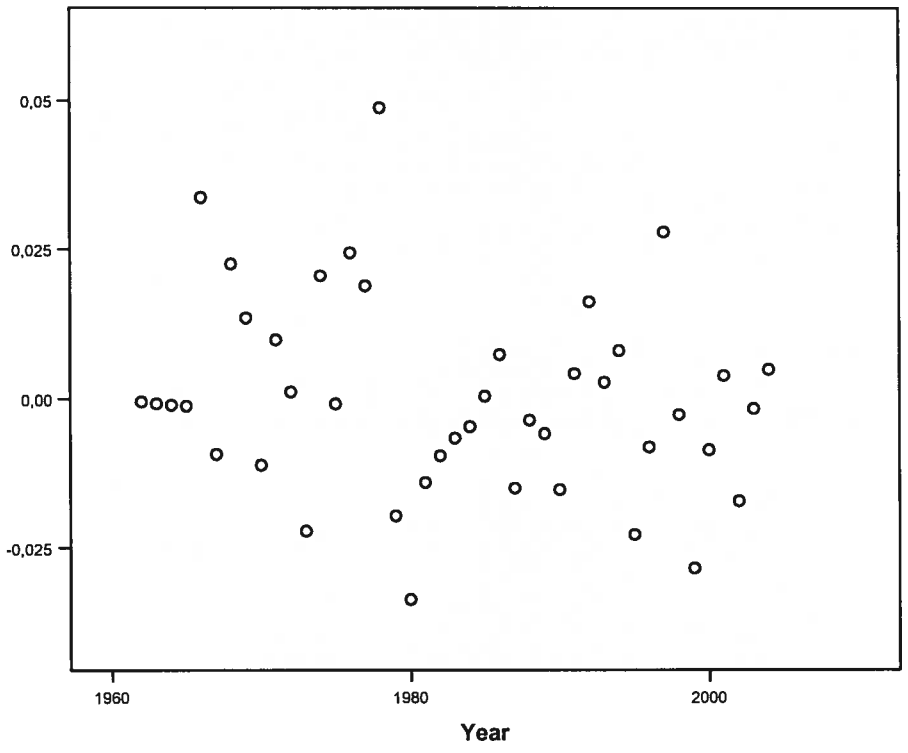


Figure 11: Residual Plot for the Parricide Model

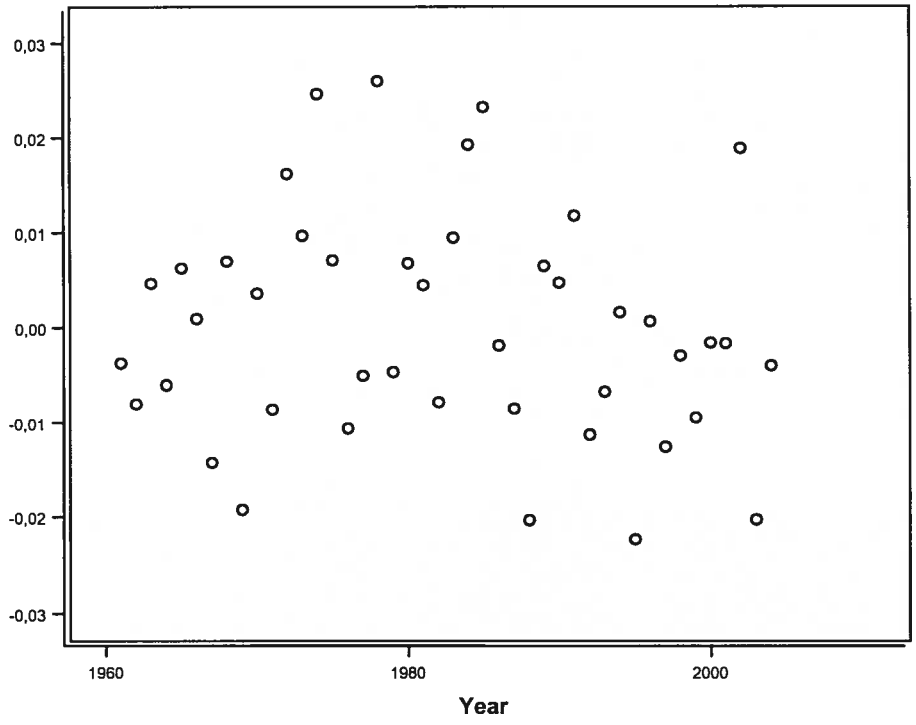


Figure 12: Uxoricide before Stabilizing

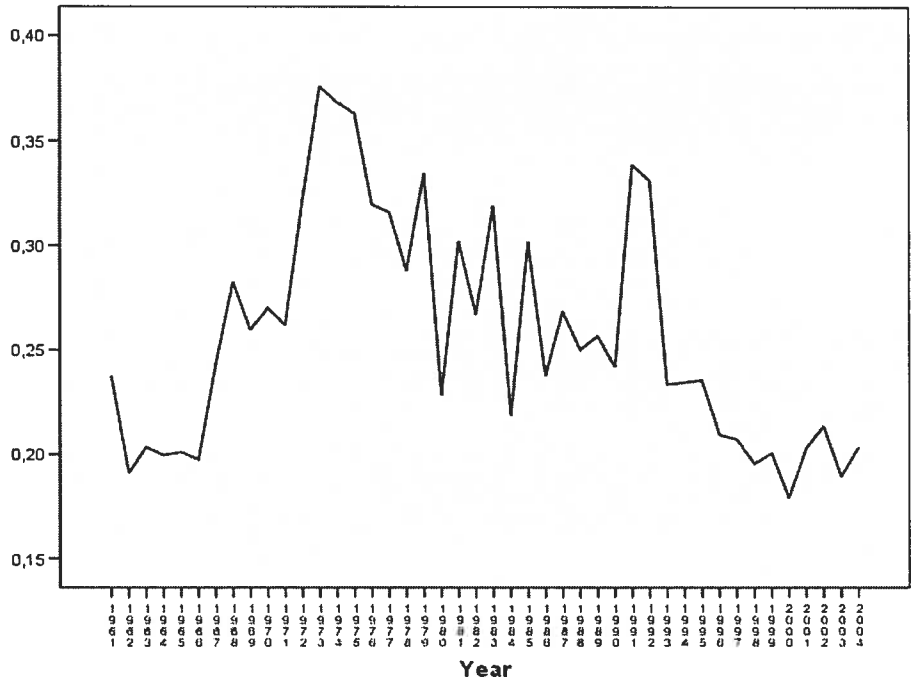


Figure 13: Uxoricide after Stabilizing

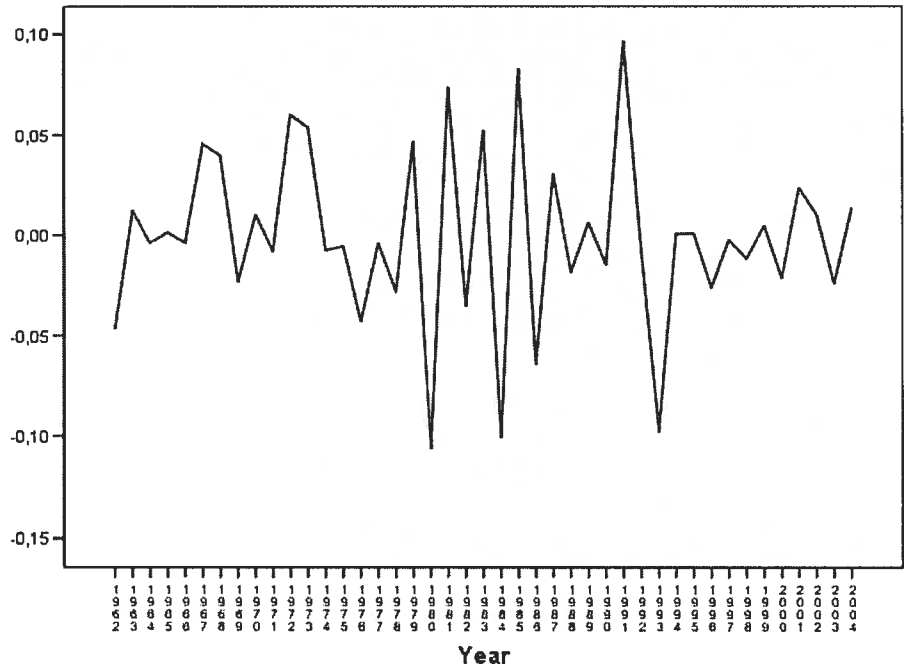


Figure 14: Paternal Filicide before Stabilizing

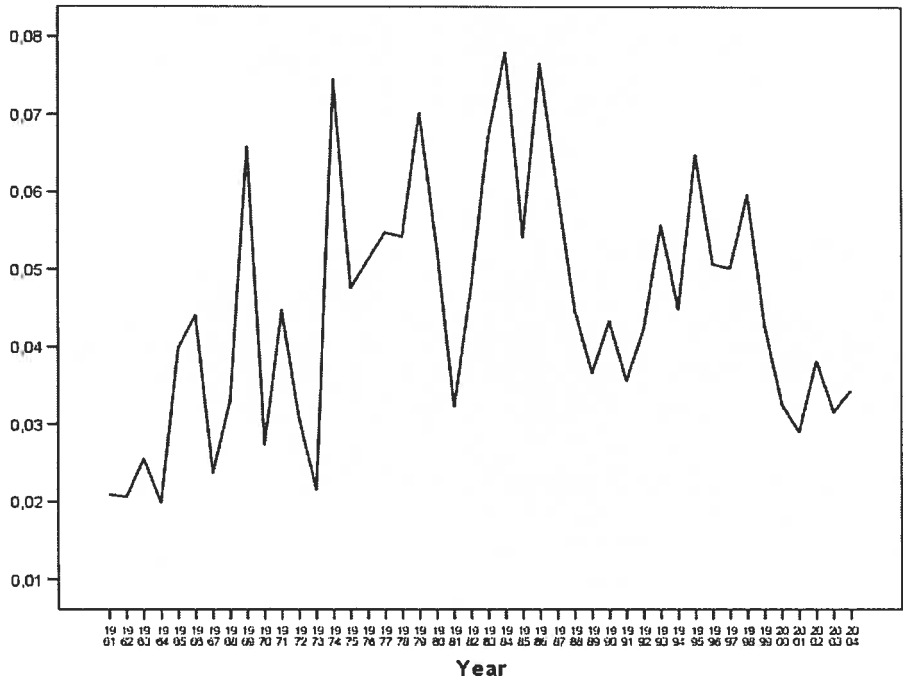


Figure 15: Paternal Filicide after Stabilizing

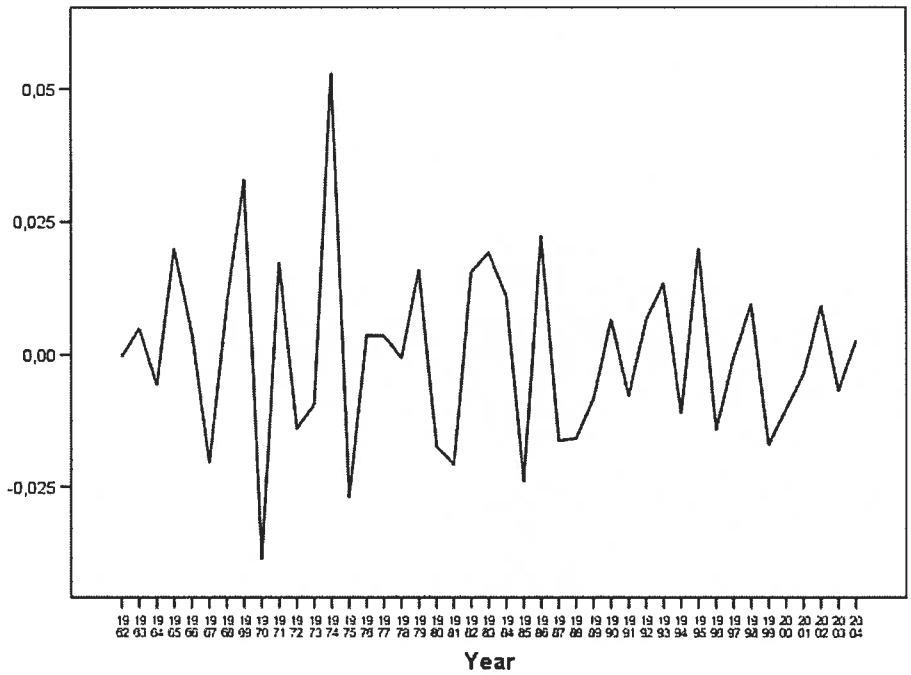


Figure 16: Maternal Filicide before Stabilizing

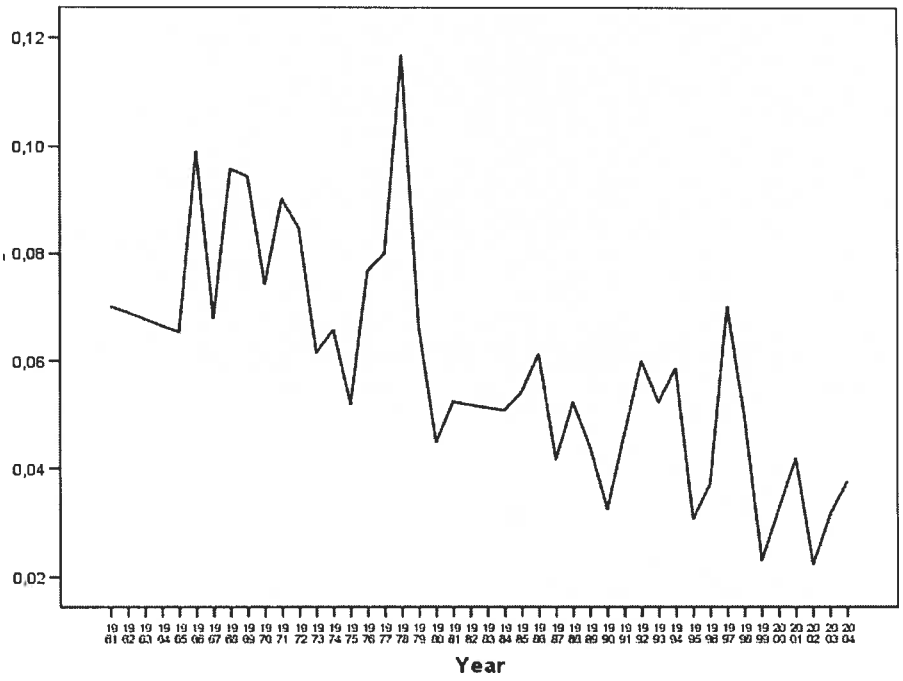


Figure 17: Maternal Filicide after Stabilizing

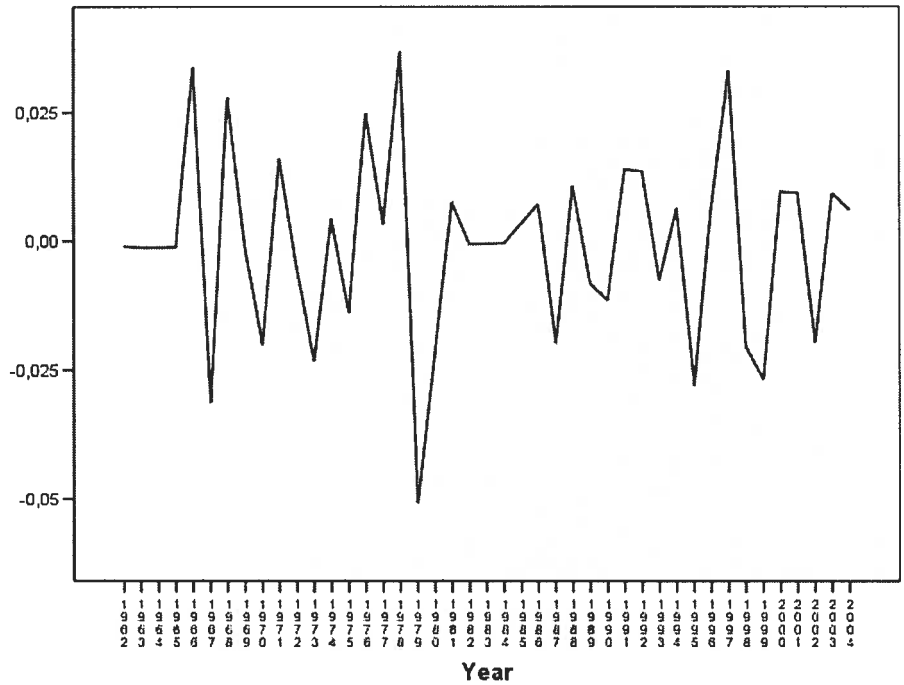


Figure 18: Parricide before Stabilizing

Figure 19: Parricide after Stabilizing

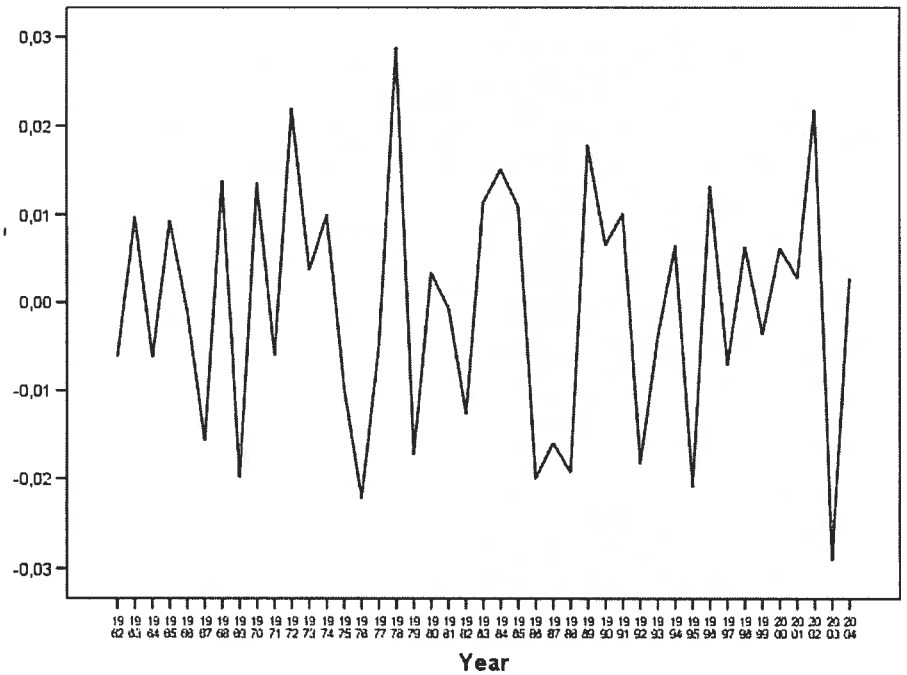


Figure 20: The Evolution of the Total Property Crimes Rate from 1977 to 2004[18]

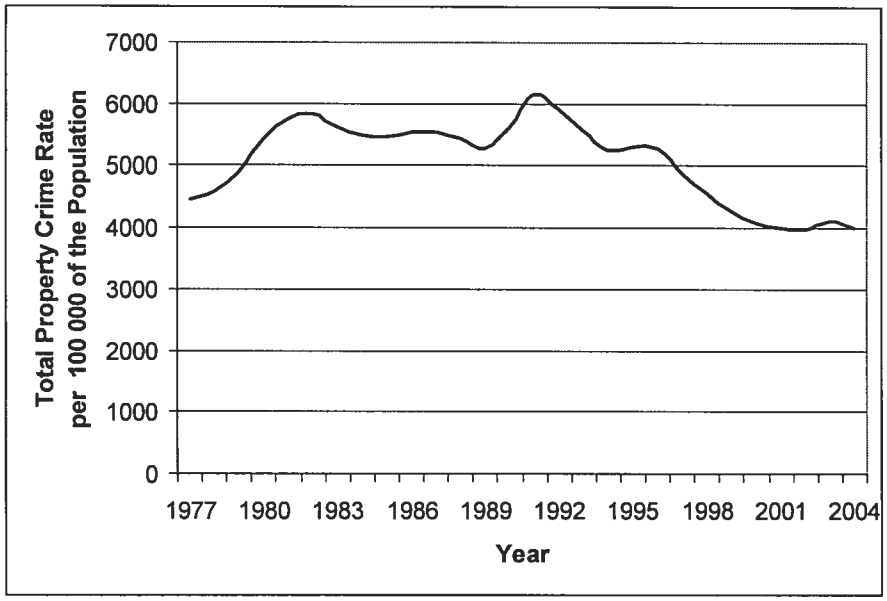
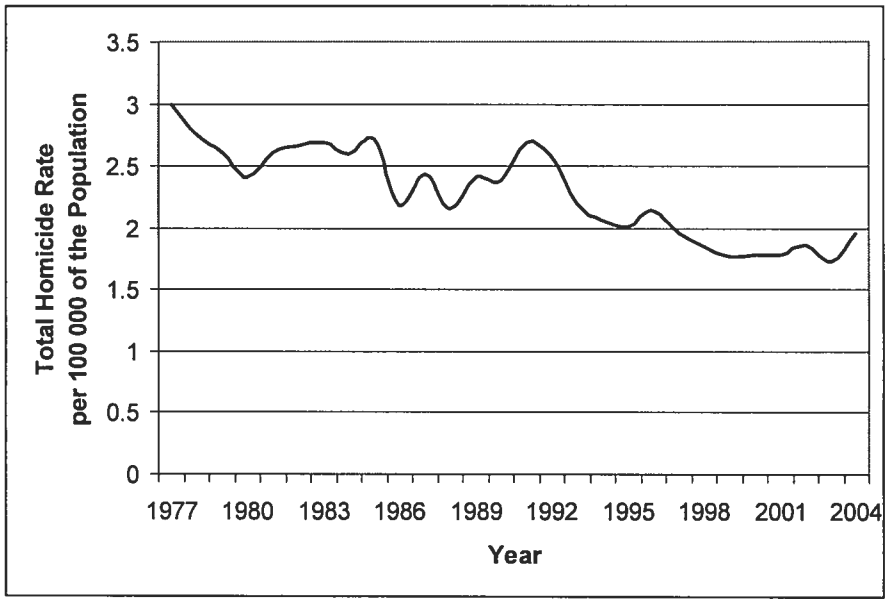


Figure 21: The Evolution of the Total Homicide Rate from 1977 to 2004[19]



[18] Source of data CANSIM Table 252-0013 Crime statistics, by detailed offences, annual.
[19] Source of data CANSIM Table 252-0013 Crime statistics, by detailed offences, annual.